THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME V.

EDITED BY G. WHARTON SIMPSON.

"*Nulla recordanti lux est ingrata.*" —MARTIAL.

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PREFACE.

WE have reached another of those halting places which enable us to address ourselves directly to our readers, with less formality than belongs to the usual impersonal character which appertains to Journalism. We have, since we undertook our present editorial position, found so many courteous correspondents and able contributors amongst our readers, that we feel ourselves as addressing rather a wide circle of friends than the dim, unknown, shadowy band, which it is the fate of writers often to address, and we feel, therefore, that but few words are necessary as preface to our FIFTH VOLUME. It contains the records of a year's experience—the chronicle of a year's progress amongst photographers in every quarter of the globe. By means of the reports of meetings, contributions of papers, and the aid of correspondents, professional and amateur, we believe we have been able to keep our readers familiar with every fact of importance, materially bearing upon the interests of photography throughout the world. Whatever has conduced to the perfection of the art in scientific discovery, whatever has tended to the improvement of its various appliances, optical, chemical, and mechanical, whatever has promised to increase the range of its applications, has been, we believe, carefully noted and faithfully recorded.

A journal in the present day, however, scarcely fulfils its mission, scarcely achieves its duty, unless it is the pioneer as well as the recorder of advancement—initiating improvements as well as chronicling their progress. How far we have worthily filled this position becomes us not to decide: we have at least always discharged our duty with a full consciousness of its responsibility, fully sensible of the honour conferred upon us by the trust of our readers, and with an earnest endeavour to be truthful to that trust. By our own pen, by selecting our collaborateurs and directing their labours, we have steadily endeavoured to widen the scope of the art and its applications, to exalt its aims, to give increased prominency to its art aspects, to simplify and establish its theories, to improve its practice, to maintain its dignity whilst increasing its popularity, to give it, in short, increased value and interest for every one who pursues it, whether professionally, or as amateurs. And we have here to record our deep tribute of thanks to the multitude of friends who have aided us in our task, whether by their esteemed volunteer contributions, their valuable advice, or kind sympathy.

All our aims and intentions our readers well know, and how far also we have maintained them. It is unnecessary to enter into fresh pledges here. All that the PHOTOGRAPHIC NEWS has been, as an organ of photographers, and a faithful exponent of their art in its scientific, artistic, practical, and commercial aspects, it shall continue to be: all that it might and should be in addition, we will strive to make it, various arrangements being now in progress for giving to our next volume fresh interest. Regarding these arrangements it is only necessary to say that we shall not deem it needful or desirable to travel beyond the legitimate range of photography in search of novelty. The continually expanding character of the art in its varied relations, invests it with ever new phases of interest, and demands from the photographic journalist every year more concentrated and undivided attention. The year that is coming will, we believe, be an important one to our art, and the gage which England has thrown down to all comers in the tournament of nations, will impose important duties on conscientious journalists in every department of science, art, and literature. We promise our readers to endeavour to be worthy of our position and of their confidence, in the coming year, as we trust we have been in the past. The date at which we write permits us, in conclusion, the opportunity of wishing to each of our readers a happy Christmas and a prosperous New Year.

32, PATERNOSTER ROW, *December 24th*, 1861.

THE PHOTOGRAPHIC NEWS.

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OUR NEW VOLUME.

In the present volume we have, according to previous announcement, made arrangements for the appearance of a variety of original contributions, some on subjects hitherto untreated, and others on subjects but imperfectly known, as not coming within the every-day experience of the photographer. We may mention amongst those for which arrangements are completed, The Technology of Art as applied to Photography, by Mr. A. H. Wall; a series of practical papers on Instantaneous Photography, Marine Photography, Astronomical Photography, Printing Transparencies, Enlarging, Printing on Ivory, &c., &c., by Mr. Samuel Fry; Notes and Jottings, and on Lithography and Photolithography, by Mr. Hannaford; on Photographic Chemicals—their Manufacture, Adulterations, and Analysis; and on the Lime Light and its application to Photography. The majority of these articles will appear at once, and will be continued regularly. As, however, the demands on our space made by matters of current interest will not permit of the whole of the subjects appearing weekly, some of the subjects will appear at fortnightly, instead of weekly, intervals. We have reason to believe, from the correspondence we have received, that the arrangements for our new volume will be regarded with universal satisfaction amongst our numerous readers.

A GLANCE AT PHOTOGRAPHY IN 1860.

A very brief retrospect of the photographic history of the past year will be necessary here, as we presume that the majority of our readers have read the "Annals of Photography" for the year, published in our Almanac.

Notwithstanding the unprecedentedly unpropitious weather for photography which has prevailed, the year has been marked by decided progress. Whilst no startling discovery of new principles has been made, many interesting modifications and applications of known theories have come into operation; and a more widely spread and intelligent knowledge of the scientific bases and practical details of the art, has become general amongst its votaries.

With the most important improvements in processes and apparatus our readers are already familiar, and we have not space for a recapitulation. We may, however, for a moment just glance at one subject which the experience of the year has done much to bring to a satisfactory solution; but which still requires careful attention: we refer to permanent silver printing. We believe that the experience of careful and skilful photographers has resulted in a decided conviction of the permanency of silver prints when toned by the alkaline gold toning bath, and fixed and washed with care, and intelligent apprehension of the known principles appertaining to these processes. We know that many failures have occurred, both as to beauty, and permanency of results; but we feel assured that these are not necessary contingencies. As regards brilliancy of tone, the failures have chiefly arisen from imperfect preparation of the paper, or from the use of a sample unsuited to the character of the negative and to the results desired. Much depend on the original character of this unprepared paper, as may be conclusively shown: and we trust that the experiments in this direction, in which Mr. Jabez Hughes is engaged, and the results of which we shall publish when completed, will throw much light on this subject. As regards the question of permanency, we feel convinced, notwithstanding the doubts expressed by some respectable authorities, that if the manipulations are performed with judgment, the fixation effected in fresh neutral hypo of sufficient strength, and the washing properly performed, the utmost permanency is attainable. We have seen, and toned ourselves, during the last two years, some thousands of prints, and scarcely one failure in any respect not readily traceable to its cause. That some further knowledge is yet to be attained, as to the precise qualities of paper and preparation best suited to produce at will the exact quality of tone desired, we do not deny; but we deprecate the tendency to condemn or undervalue on light grounds a process at once so scientific in character and permanent in result.

One of the most gratifying features of the progress of the year is the increased attention given to the Art aspects of photography. There is, we believe, a general interest beginning to be felt amongst the more intelligent photographers in application of the principles of Art to the production of photographic pictures. Lenses and processes, however perfect, are beginning to be regarded as but the material or mechanical appliances of the art; its pencils and pigments, its paper, panels, or canvas. Whilst not undervaluing these, nor the highest manipulatory skill in using them, the importance of a knowledge of principles governing pictorial excellence is beginning to be more highly appreciated. To this end we have the satisfaction of thinking that the contributions appearing in our own columns from the pen of our talented contributor, Mr. Wall, and others, have largely contributed; and we have especial pleasure in calling attention to one of the most eloquent papers we have met with in photographic literature, on "Art-Photography—its Scope and Characteristics," which appears in the present number; and to the "Technology of Art," as applied to photography and other Art contributions, commenced in the present volume.

In this direction, largely, lies the future of photography: on this basis, in an essential degree, must the success of the professional portraitist be established. In this respect only can he distinguish himself from the herd of pests and degradations to the art, who occasionally figure in police reports as "Photographic Artists," (heaven save the mark!) for assaults upon unwary customers, whom they have inveigled by false pretences into their dens, for Sunday touting, and other practices, in contravention of law and decency. In simple, clean, sharp, mechanical photography, such "artists" may, more or less, successfully vie with respectable portraitists. But it is in higher qualities the professional artist-photographer must hope to maintain his position.

Closely allied with this aspect of photography, both in character and importance, is the advancement made in the art of photolithography and photozincography. A specimen of the latter we presented to our readers in the beginning of the year. For the purpose for which it is intended, nothing can be better; and our readers are familiar with the very large saving it effects in the cost of producing copies of the maps in the Ordnance Survey Office at Southampton. Results not inferior in merit have been produced by other distinct processes of photography: one in Vienna, on which the action of light on asphaltum is made available; and the other that of Mr. Osborne of Australia, the details of which we recently gave, in which the photogenic action of the salts of chromium, in combination with organic matter, forms the basis of the process. A specimen produced by Mr. Osborne has just been issued in the *Photographic Notes*, and is equal to anything of the kind we have seen. The most recent contributions of photography to the printing-press is the process of Herr Pretsch for surface block-printing, which is, however, as yet in its infancy. The first specimen we saw, which was printed with great care, and issued in the *Journal of the Photographic Society*, possessed many excellences, and was full of promise; the last issued specimen, in our Liverpool contemporary, was so much inferior that it tended to destroy that promise. It is, we doubt not, capable of further improvement; and if it can be made available for general subjects, Herr Pretsch will have contributed one of the most valuable improvements issued in connection with photography. M. Joubert's system of phototype, although very promising in result, being a secret, does not admit of comment. As yet none of these processes are available for the highest classes of book illustration. More is yet to be done, and we do not despair of seeing the time when photography shall have largely superseded the graver and burin.

Perhaps few things speak more encouragingly of the vitality of photography than the state of the various photographic societies; whilst a few have gone out of existence, others are starting into being, and the majority exhibit an energy and activity in the highest degree cheering.

We have not space even to glance at many of the important photographic features of the year; although interesting as celestial photography, or annoying as the unjust proceedings at South Kensington Museum. We here take leave of the past year, and hope for our readers more congenial weather, with every success, photographic and otherwise, in the year to come.

ART-PHOTOGRAPHY: ITS SCOPE AND CHARACTERISTICS.

BY. C. JABEZ HUGHES.*

PHOTOGRAPHY, hitherto, has been principally contented with representing Truth; cannot its sphere be enlarged, and may it not aspire to delineate Beauty too? All men love Beauty. The sentiment of Beauty is innate in us. It is not only a part of our nature, but one of the best parts. We have no evidence that any other creature on God's earth has the perception of Beauty but man. The poor savage, the dull boor, and the educated man, all love Beauty. The child loves Beauty, the youth and maiden dream of Beauty. The strong man toils night and day for Beauty, and the aged ones close their eyes, and look with confidence into that bright world they are hastening to, for the full realization of all their disappointed hopes of Beauty. The mother sees Beauty in her babe, children in their parents, and lovers adorn each other with a Beauty concealed from all other eyes.

And there are different kinds of Beauty; there is Material Beauty, Intellectual Beauty, and Moral Beauty. The love of Beauty is no narrow feeling; the man full of it cannot contain himself, but must communicate it to his fellows; and the ways of its expression are various. Some give utterance in

"Thoughts that breathe and words that burn:"

other seize the rude clay and solid stone, and carve enduring monuments; but the more general form of its expression is pictorial.

Man is the only animal that makes pictures, and all men love pictures. The earliest form of writing is pictures. The only universal language is pictures. Earliest history records the existence of pictures, and the child's first passion is for pictures. Civilization and pictures go hand in hand, and the more civilized men are the more they value them. "Man cannot live by bread alone," but must have pictures. Every art that man can invent is applied to increase the production of pictures. The steam-engine, printing-press, electricity, all must help to produce pictures. The child's first lesson is from a picture-book. Dry science is made interesting, and fiction more fascinating, by pictures. The more man becomes educated, the more he requires pictures; for education and pictures are indissolubly connected. The highest art and deepest science are concentrated on pictures: we paint them by Light, print them by Steam, engrave them by Electricity, and distribute them by the Railroad.

If pictures, then, exercise so powerful an influence, how highly may we estimate the greatest picture-producing power ever devised!—I mean our glorious Photography. What invention was ever more deeply appreciated, more fondly cherished, more devotedly cultivated than this child of the Sun? What art can boast in so short a time of so numerous a band of attached disciples? Others may have added more to our material wealth, but none have communicated so much pure and unalloyed good, in aiding science, assisting art, and by the humble but potent aid of exchange of portraits, ministering to and keeping alive in every part of the globe, those warm domestic and holy feelings of affection which are the very bases of our nature.

Our business just now is not with the usual applications of photography. We seek the higher forms of pictorial representation, and wish to know whether the artist-photographer may not, by the aid of the camera, as legitimately express his love of beauty, as the poet by his pen, the sculptor by his chisel, or the artist by his brush? The means are different, but the end is the same.

Permit me, before proceeding further, to make a few distinctions, to assist us in discussing our subject. I propose to divide general photography into three classes, Mechanical Photography, Art-Photography, and, for want of a better term, High-Art Photography.

* Read at a meeting of the South London Photographic Society, Dec 20, 1860.

Mechanical Photography will include all kinds of pictures which aim at a simple representation of the objects at which the camera is pointed, and will not only include all reproductions, but the great majority of portraits and landscapes. Let it be understood that I do not mean the term *mechanical* to be understood depreciatingly; on the contrary, I mean that everything that is to be depicted exactly as it is, and where all the parts are to be equally sharp and perfect, is to be included under this head. I might have used the term *literal* photography, but think the former better. This branch, for obvious reasons, will always be the most practised, and where literal unchallengable truth is required, is the only one allowable.

Art-Photography will embrace all pictures where the artist, not contented with taking things as they may naturally occur, determines to infuse his mind into them, by arranging, modifying, or otherwise disposing them, so that they may appear in a more appropriate or beautiful manner than they would have been without such interference. This class may easily embrace almost all subjects. In landscapes, the artist may select the period of the year, the condition of the weather, time of the day, point of sight, length of exposure, &c., as material agencies in modifying his picture. The same in portraiture, by arrangement of light, pose, expression, presence or absence of accessories, &c.; also in the composition of pictures, by the due attention to all the necessary parts, so as to form one harmonious whole.

High-Art Photography.—This distinction may appear presumptuous, but I feel a necessity for it, to include certain pictures which aim at higher purposes than the majority of art-photographs, and whose aim is not merely to amuse, but to instruct, purify, and ennoble.

If such distinctions as these be admitted, we can the more easily discuss the various kinds of pictures, and assign them each to their proper class.

Our more immediate object is with what I propose to call art-photographs. With many of these productions we are quite familiar, particularly those of that true artist-photographer, Rejlander. The idea of producing art-photographs is not a new one; it is almost coeval with photography itself. In 1845, Mr. Mayall, then of Philadelphia, designed and executed a series of ten pictures on daguerreotype plates, in illustration of the Lord's Prayer. This series was highly appreciated in America, and when exhibited in this country received high encomiums from the art press. In 1848 he composed a series of six, illustrative of Campbell's "Soldier's Dream." It is to be regretted that these were only on silver plates, as they were confined therefore to his own gallery, and the great merit they possessed known only to a few. Numerous other art-photographs he composed, particularly a very fine one in illustration of the words, "And this Mortal shall put on Immortality." This work, for the fineness of conception, and noble simplicity of execution, in my opinion exceeds all that has yet been produced. This gentleman, though he has precedence in point of time, has done little or nothing in this line lately, and it is to Rejlander we are mainly indebted for popular illustrations of art-photographs. Mr. Robinson has also produced some very superior productions of this class, of which his last one, "The Holiday in the Woods," is by far the most ambitious, and by many considered his best; it is certainly the largest, but there is a deep pathos and feeling about his "Fading Away," that gives that picture a far higher place in my mind than any of his other productions.

Rejlander occasionally, and Mr. Robinson often, use more than one negative to produce their pictures.

To describe this class of picture, a word has been coined—Composition-Photography. Now, I object to this word, as descriptive of what I propose to call art-photographs. It is not sufficiently definite, and is open to misconstruction, and moreover, it is descriptive rather of the means taken to produce the picture, than its nature when done.

I may be told, that "composition," in an artistic sense, means the operation of devising, arranging, modifying, and successfully carrying out the artist's conception. The idea may exist in the painter's mind, but the reducing to practice, in a proper and harmonious manner, the various parts required to form the picture, so that the idea conceived shall at last be adequately expressed—this operation, partly mental, partly physical, is what an artist will tell me is meant by composition, and that photographs produced by such means he would call Composition-Photography. Well, in an artistic sense this is right, but as the word is for photographers, they cannot be expected to understand it in this refined and technical sense, but will attach to it the plain and literal meaning, a print *composed* from different photographs.

Take a notable art-photograph, Rejlander's "Two Ways of Life," and ask an artist if that is a composition-photograph? "Most assuredly," he will say, "as much so as any painting, and a very clever composition." Now ask a prosaic photographer, "Is that a composition-photograph?" and his reply will be, "Certainly, composed from ever so many negatives, and very nicely printed-in."

Now that cannot be a very happy word, that is capable of conveying such different meanings relating to the one subject.

Again, take Lake Price's "Don Quixote in his Study," or his "Roman Festa," and ask the artist and the photographer, are these composition-photographs? The artist will exclaim, "Yes, and fine ones," while the camera-man will declare "they are nothing of the kind: they are both from single negatives, and printed all at one time."

Here I fancy I hear the man with the black fingers exclaim to the artist, "What do you know about photography? come here, and I'll show you something worth calling a composition-photograph. Here's a print five feet square, composed of twenty-five negatives, and I'll defy you to tell where one ends and the other begins. They are taken from a large map. That's what I call a composition-photograph!" Artist (with knitted brows and violent manner), "That a composition-photograph! It's no composition at all; mechanical drawing by sunlight, nothing else."

This is sufficient to show that the term composition-photography is not definite enough, and that it will be difficult for the photographic mind to separate it from the idea of printing from many negatives. Indeed, if we don't mind, we shall get into trouble and confusion with this question of printing from many negatives, by allowing mechanical ingenuity to usurp the place of artistic skill. For my own part, I don't like printing one picture from several negatives. There may be times when it cannot be avoided; but, wherever possible, it should be carefully shunned. Artistically speaking, it is false in principle, and photographically a step in the wrong direction. Its tendency is to cripple art and degrade photography. It is making the conception of the artist depend on the skill of the printer. It is a confession of weakness on the part of both, by doing in fragments what is ultimately to be represented as if done as a whole.

When an artist conceives a brilliant thought, and hastens to put it on canvas, how he sighs that he is obliged to work piecemeal, that he cannot with one sweep of his brush realise the thought in his mind. It is the proud boast of photography that it can do this. In depicting a portrait it does not begin with the head, go on with the hands, then put in the drapery, and finally the accessories: it works all at once, as a whole. This is the natural mode, and it was reserved for patchwork-photographers to discover the method of taking the head on one plate, the body on another, and the feet on a third, and then by printing them together to produce a tasteless monstrosity.

See yon lovely landscape of hill and dale, water and sky, how shall I proceed to depict it? Shall I first photograph the river, and then do the trees—next week take yon hoary old castle, and some other time the distant hills and sky, and then, by ingenious printing, fit and match them together, like a child does its toy puzzle? Or shall I uncover my lens, and with one effort seize nature with all her native charms, her local and general hues, her natural *chiaroscuro*, just as she now is, and as she never will be again?

I fancy I hear some one say, "But you cannot get this natural harmony; you may secure the landscape, but you lose the sky, or you get the sky and lose the landscape; and the argument now is, can we not print the sky into the landscape, or the landscape into the sky, and so make the photograph perfect?"

That is exactly the question, can we do this? Let us hope we can. Let us try, but bear in mind mere printing clouds into landscapes is not making perfect photographs. A fine photograph of clouds and sky is one of the most beautiful we can depict; but to join it on to a landscape, without having a most tender regard for the nature of the subject, instead of raising the photographer to the rank of an artist, will only degrade him to the level of a mechanical printer. An outcry has justly been raised against white-paper skies, but don't let us run into the opposite error of indiscriminately printing-in clouds. No sky will ever harmonize like the one that existed when the view was taken. Let the efforts then be to take the natural sky simultaneously with the landscape. In this direction lies the true progress of artistic landscape photography.

Until we make further advances in our art, we shall be troubled, especially in out-door work, with the unequal reflection of light; but let our ingenuity be exercised rather in devising means of giving short exposure to the sky, and longer to the foreground, so that they may simultaneously be produced. I think this better than, by tricks and dodges, to print-in another sky, which, under the best circumstances, can be but a sorry substitute for the natural one.

Before concluding this incomplete essay, allow me to say a few more words on Art-Photography. I feel that photography is capable of being made to minister to higher purposes than any to which it has yet aspired, and that it will as certainly take its place as a fine art as sculpture or painting. How early, depends on the earnestness, truthfulness, and intelligence of its votaries.

The tendency just now is to produce art-photographs by fragmentary portions, rather than direct and all at once.

Strictly speaking, this consideration does not lie in our province. A photographer, like an artist, is at liberty to employ what means he thinks necessary to carry out his ideas. If a picture cannot be produced by one negative, let him have two or ten; but let it be clearly understood, that these are only means to the end, and that the picture when finished must staud or fall entirely by the effects produced, and not by the means employed. When judging of a paintiug, we do not ask the artist how many sittings he took from his models, or how often he arranged his lay figure; these are the mechanical appliances of the arts—the mysteries of the printing and painting rooms.

I lay stress on these points, because I find persons dwelling too much on the beauties of an art-photograph, and praising the artist *because* he composed it from so many negatives, thus exalting too highly the mechanical instead of the artistic skill.

We have abundance of mechauical ability, it is the artistic we want to cultivate. For my own part, I am sorry to see that an artist photographer is obliged to have recourse to more than one negative, and can fancy how he must be annoyed and crippled by working in this fragmentary way.

Of two given pictures, equal in merit and design, that one is the best which is secured by the *fewest* negatives; for he is the higher artist who produces the greatest results with the smallest means. I consider it, then, rather a demerit, that a given picture should require so many negatives to produce it; it indicates a poverty of means or design, and is so far a reflection on the art, or the artist, or both; for, after all, the ultimate picture must appear as if produced from one negative. Not only are the manipulatory difficulties increased, but the risks run are very great of altogether destroying that natural harmony and chiaroscuro always present in a picture taken from one negative.

Finally, I do not think the advocacy of composition-printing tends to advance Art-Photography. It starts with putting clogs and fetters upon it. As mind is higher than matter, so is art loftier than mechanics. The artistic mind is not mechanically inclined. It is better—clearing all obstacles from his path—to allow the art-photographer free scope to his fancy, and, trammelled with few mechanical details, to give him freedom in the use of the camera aud printing frame, as the legitimate vehicles of expressing his conceptions of Beauty.

In this way only, loving our Art, can we hope to elevate it.

As Mechanical Photography deals with Material Beauty, so let Art-Photography treat with Intellectual Beauty; and when deep and earnest minds, seeking to express their ideas of Moral and Religious Beauty, employ High-Art Photography, then may we be proud of our glorious Art, and of having aided in its elevation.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

CONFIDENT that Art is now beginning to occupy no small share of attention among photographers at large; believing, with good reason, that there is amongst them an increasing desire to possess at least the more general ideas associated with its study; and well convinced by personal experience that we can best minister to such desires by marshalling our ideas on the subject under certain authorized heads, we commence these papers.

Nearly all, if not all, our terms of art have had their origin from foreign sources. Many are derived from the refined peoples of antiquity, and most of them are of Italian birth. From this cause, perhaps, as giving licence to the boldness of occasional caprice, combined with the carelessness of some writers, and the ignorance of others, the terms of art have suffered much in the clearness and importance of their popular definitions; but they are now more than ever endangered by frequent misapplication among the numerous votaries of photographic art; among whom error and misconception in reference to such nomenclature abound exceedingly.* Herein lies, we think, the more urgent necessity for such a work as the present.

The technicalities of art, it should also be remembered, had doubtless their real origin in the exigencies of the artist's noble craft; whereas, photography, must perforce adopt such terms as already exist in connection with kindred pursuits. It may, therefore, easily be imagined that in applying these technicalities to an art so novel and so strange in its various peculiarities, such terms would necessarily undergo some slight change or modification of meaning; and this being the case, it must, we think, be very desirable that such alterations—whether great or small—should be clearly expressed, in order that students may not become confused in their proper application during practice.†

For the sake of system and ready reference—as has been already explained—these articles will appear in alphabetical order. They are not intended to form a mere glossary of terms used in art, but rather to convey a series of practical

* As an illustration we may mention that we had our attention recently called to a case where, in a paper of instructions issued by an eminent photographic chemist, a statement is made to the effect that the use of a lens of long focus in a dull light is apt to produce a want of *breadth*! The term *breadth* was here manifestly confused with *vigour* or *brilliancy*, qualities which, whilst not antagonist to, are still less synonymous, with *breadth*.

† A very glaring instance of this is pointed out in Mr. Hughes' eloquent and excellent paper on "Art Photography" in the present number.

instructions in the real value, purport, and significance of the technicalities defined, in their application to photography.

Having shown why we believed our labour in this view would not be unwelcome or useless to our readers, and explained our purpose in regard to them, we have now only to add that if the abilities we devote to the task be of the humblest, we will endeavour to make good the deficiency by increased care and study in carrying out our design.

Abozzo.—A term used by the Italian Painters, to indicate the first, or dead-colouring, of a picture. As this was usually executed in one or two colours only, the appearance of such a sketch would closely resemble that of a warm-toned photograph. This fact is a strong argument against such writers as have asserted the impossibility of anything like real artistic colouring being obtained when applied over the hues of a photograph; which, by the by, may be toned to a colour precisely similar to that in which the great Titian usually executed his *abozzo*, and upon which, in some seven or eight after paintings, he wrought up his inimitable effects of colour.*

Accessories.—Objects introduced into a picture as auxiliary to the general effect. Inartistic photographers are very apt to make use of such rather for qualities peculiar to the objects themselves, than with a view to their effect in carrying out the rules of pictorial composition. While the injudicious use of accessories is sure to destroy the artistic value of the photograph,† their importance to the complete effect when introduced with good taste and proper judgment, cannot well be overrated, apart from the opportunities they afford the colourist of bringing forward the more attractive qualities of his art, or the purpose they assist in telling some tale in connection with the principal subject. Accessories are used to secure breadth of chiaroscuro; to fill up unostentatiously such portions as would appear bare and naked without them; to preserve the balance of parts, and the proper arrangement of lines. They should never divert attention by their prominence, or otherwise attractive character, from the more important group or figure of the piece. They should not be numerous; and they should be so arranged that their several powers concentrate into a focus just where pictorial excellence demands that the principal effect should exist.

Accidentals.—Used to indicate artistic effects of a transient or accidental character. An eye to recognise with skill, and appliances to secure, the numerous effects of nature—which, being due to some transient atmospheric influence, some chance display of nature's least common aspects, or some purely artificial influence, are termed accidental—rank among the landscape photographer's most desirable acquirements. No finer illustration of this can be pointed out than the results produced, photographically, by the thousand transient effects to be observed upon the surface of water, which will sometimes render one picture taken but a few seconds after another, and with precisely the same exposure, to be so palpably superior, in both an artistic and photographic sense, that the mere mechanical operator, attributing the result to some abrupt, unknown, and mysterious change in his chemicals, almost worships the blind chance to which he attributes it; whilst he slights that knowledge, which would enable him to command the valuable result, whenever the natural chance to which it was due might arise. Those effects of nature which are termed accidentals in a picture, should, however, receive from the photographic art-student a very large share of serious attention, whether his studies be pursued for landscape, portraiture, or other pictorial branches of his art.

Accidental Lights.—Lights which owe their existence to some accidental circumstances of a natural or artificial character; or such peculiar effects as may arise from gleams of light penetrating an accidental aperture, or proceeding from a fire, a candle, or some supernatural source—as in the celebrated "notte" of Corregio, in which the light emanates not only from the ordinary source, but also from the infant Saviour's body. Accidental lights are extremely pleasing and picturesque when judiciously introduced, and have then an important effect in the chiaroscuro, composition, and sentiment of a picture. They frequently fall within the camera artist's field of practice, and should be studiously looked for. A very effective accidental light may frequently be secured by a method recommended by one of our own correspondents, of forcing aside the boughs of trees*; by which means a stream of light may be admitted into some wild nook of forest scenery, some foliage-overshadowed cavern, or some otherwise obscure thicket of trees; thus giving a romantic or picturesque charm to a subject which might otherwise be dull, tame, and ineffective. Many charming qualities of this nature are overlooked by mechanical operators, simply because they have never understood the great pictorial value of such accidental effects.

Accidental Points.—Vanishing points in linear perspective, which do not fall upon the line of the horizon.

Accidental Colour.—In looking fixedly at any one colour the eye soon begins to conjure up another colour which is the proper contrasting or complimentary hue of the first: thus if you place a red wafer upon a sheet of white paper, and look at it stedfastly, upon turning the eye to another part of the surface a faint green wafer will become visible—the eye having itself supplied the accidental, or contrasting, or complimentary colour. Colourists should remember this fact, because in turning from working upon any one colour for a certain length of time, and begining to be employed upon another, the last would for a while be modified by the accidental colour of the first. For instance—suppose you are painting a scarlet coat, and turn from it to the flesh, the latter—until the eye has recovered its former condition—will appear too green, and also, by contrast, too pale.

Action.—That which has no small influence in giving life or animation to a picture. It is usual, in giving a definition of this word, to draw a distinction between it and motion; and such a distinction is really necessary—art can but suggest motion—those who attempt to force its powers in this direction, too frequently render themselves ridiculous. That which never moves should not be represented in absolute motion. Motion which has just ceased, or which is on the eve of just commencing, may be legitimately and advantageously adopted, but one step beyond is fraught with serious danger. Just imagine a figure represented in the act of walking, with one foot suspended as it were in the air, and ask yourself, if such a representation would not be a gross infraction of good taste. Photographs of figures taken in rapid motion have been executed—but merely as curiosities, to illustrate the rapidity of a certain process—in which sense they are interesting and valuable. I do not deny that some eminent masters have combated this difficulty, and, to a certain extent, conquered it; but the example is not one I should dare to recommend. Action is very significant of life, and is the source of that gracefulness of outline which cannot be overrated. In portraiture, much may be secured in the way of character, by varieties of position and attitude indicating action, but care should be observed in avoiding the slightest appearance of affectation. See further remarks under the heads of Attitude, Motion, &c., in the forthcoming portions of these papers.

PHOTOGRAPHIC CHEMICALS:

THEIR MANUFACTURE, ADULTERATIONS, AND ANALYLSIS.

IN accordance with a promise contained in our last number, we now commence a series of articles, having for their object a complete practical guide to one of the most important branches of scientific photography. We have been induced to undertake them for several reasons; apart from the numerous enquiries which we have received from our con-

* A hint some of our artistic colourists may find worth their taking.

† "When accessories are introduced without any meaning or motive, and in direct opposition to the sentiment of the subject, it is an instance of bad taste"—*Mrs. Jamieson.*

* See page 103, vol. iv., PHOTOGRAPHIC NEWS.

tinental and colonial subscribers, asking for information on the best means of preparing the various chemicals which are with difficulty obtained pure, even if they are to be had at all, except in large towns,* we think that the diffusion of a little chemical knowledge on special subjects will be of great service to the great bulk of our subscribers, many of whom are, to our knowledge, continuing, year after year, the unconscious victims of the grossest adulteration in the materials they use, simply because the very easy methods of purification, and testing for falsifications, have never been properly pointed out to them. We do not know a single instance of real eminence in our art having been obtained without its being accompanied by, and in great measure due to the possession of a certain amount of chemical skill in the handling of the more simple tests and re-agents; whilst it would be easy to point to scores, who, possessing the highest artistic knowledge and manipulative skill, are fettered and bound to an inferior level by their inability to tell when their chemicals have the necessary degree of purity, or, knowing them to be adulterated, how to detect and remove the sophistication.

We purpose, therefore, to pass in detail over the ordinary contents of the photographer's store of chemicals. It will be impossible, on many occasions, to avoid entering into apparently trivial details, but in chemistry detail is everything, and when addressing those whom we must assume to be in want of the knowledge we are endeavouring to impart, it would only defeat our object to confine our remarks to the surface. Each substance will accordingly be taken *seriatim*. The best method or methods of *preparation* will first be fully entered into, the *properties* will next be described, after which will be given the various *adulterations*, with which it is likely the commercial article may be intentionally or accidentally contaminated; this will naturally be followed by the methods of *testing* and *purification*, whilst a short account of the *uses* of the substance will form a fitting conclusion. The whole will, when completed, form a complete handbook to this branch of photography, and will in many cases be sufficient to save the operator going to the expense of purchasing a larger treatise on the subject.

The first substance in order of importance, of which we shall treat, is

Nitrate of Silver.

Preparation.—The preparation of this important salt will usually require to be effected from silver coin, or from the photographer's silver residues; we will take the former case first, leaving the latter to be treated of when we describe the best method of converting residues into pure silver. The first thing to be done in the manufacture of nitrate of silver from coin (which contains silver, copper, and sometimes a trace of gold), is to dissolve the coin in nitric acid; for this purpose, take as new and heavy a silver coin as possible, (for the nominal value of old and new coin being the same, the photographer may as well get as much silver for his money as possible), it will also be better to have the coin of as small a denomination as possible; for instance, suppose five shillingsworth of coin were intended to be dissolved, there would be an advantage in taking twenty silver threepenny pieces (new), rather than one five shilling piece. First of all, it will be necessary to remove all the dirt and grease from the surface of the coins, which may be effected by well brushing them in hot soap and water containing some soda dissolved in it. After well washing with distilled water, and wiping with a piece of fine clean linen, they may be considered as sufficiently clean. All the vessels and utensils employed in subsequent operations must be cleaned in like manner. Next take a sound china (not earthenware) breakfast cup, a quarter fill it with pure concentrated nitric acid, add to it about one ounce of distilled water, and then place in the coins a few at a time. Arrange a glass funnel, upside down, so that it just rests inside the cup but not low enough down to touch the liquid; the object of this is to prevent particles of the solution from being projected out of the vessel and thereby being lost, owing to the brisk effervescence which will soon take place. Place the cup and funnel on the hob of a grate in which there is a moderate fire, for the double purpose of warming, and hastening the reaction, and of carrying off the deleterious vapours up the chimney. It will also be advisable to place the cup on a clean plate for the purpose of preventing the heat from the hob from acting too suddenly upon the cup. A lively effervescence will soon take place, torrents of a poisonous and disagreeably smelling red gas will be evolved, and the coin will gradually disappear, forming a blue solution. If the evolution of gas seems likely to cease before the coin has entirely disappeared, a little more nitric acid may be added, taking care to add to the acid, previously, about one-fourth its bulk of distilled water. When the action has entirely ceased the solution will present a clear blue colour, with perhaps a few black or brown particles settling to the bottom, these will be metallic gold, and may be collected at a subsequent stage of the operation. The next part of the process will be to get rid of the excess of nitric acid which has unavoidably been added; for this purpose take the outer vessel of a common glue-pot or some similar vessel which will allow the cup containing the solution of the coin, to rest on the top, low in the vessel, but without slipping in. The handle of the cup will be here found to be considerably in the way; it will therefore be as well to choose, in the first instance, a cup from which this useful appendage has previously been removed. Half fill the outer vessel with water, and then place it over a source of heat—a gas air-flame will be the best, but a common fire will do in default of this—and let the water boil briskly. The funnel must now be removed, its inner surface having been rinsed with distilled water into the cup, and the heating over this extempore water bath continued until acid vapours cease to come out of the cup, and the contents of the latter have become quite dry and inodorous. The cup may then be removed from the water bath, and about two ounces of distilled water added. It will now be a pure solution of the mixed nitrates of silver and copper; and the next operation will be to remove the latter impurity from it. Two methods may be adopted for this purpose; and as they will each be useful under circumstances where some of the materials necessary for the other process may not be at hand, we think it best to give each of them in succession:—

1. Pour the contents of the cup into a wide-mouthed stoppered bottle, of about a pint capacity, add to it half a pint of water and a solution of purified common salt, until the white precipitate, which will immediately be thrown down, is not increased by a further addition of salt solution; well shake the bottle, and allow it to stand and settle for a few minutes. The addition of a little weak nitric acid will be found to facilitate the settling, and, therefore, if it has been previously decided to adopt this method of purification, the whole of the acid need not have been driven off in the water bath. When the precipitate has quite settled, pour off the clear liquid (first testing it with salt to see if all the silver has been removed from it), and then fill up the bottle with distilled water, shake, allow it to settle, and repeat the above operations for several successive times until the addition of weak ammonia to the clear liquid, after it has been poured off, does not cause it to assume a blue tint. Next, add to the precipitate remaining in the bottle some large, clean, wrought-iron nails, and half an ounce of very weak sulphuric acid; allow it

* Where chemicals can be obtained pure, we by no means recommend the photographer to manufacture his own; but the knowledge conveyed in these articles of the nature of the materials used, and the methods of ascertaining their purity, will in all cases be found valuable. To our foreign readers, they will, however, prove pre-eminently important. One of several letters recently received from India, speaking of such a series, remarks, "It would be a perfect treasure to us exiles, thousands of miles from any chemists. It is most disheartening to find many exported chemicals nothing but rubbish; and I know several scientific amateurs have been driven to make their own nitrate of silver, chloride of gold, &c., &c., in despair of producing a picture unless they did so, or procured chemicals direct from home, a work of five or six months."

to remain for twenty-four hours, when the whole mass will be found to be converted into a dark grey powder: this will be metallic silver. Remove the remains of the nails from the powder, wash well first with dilute sulphuric acid, and then with distilled water in the manner above recommended, until the solution ceases to turn blue litmus paper red, when the residue will be pure metallic silver, which will only require to be dissolved in nitric acid in the same manner, and with the same precautions recommended above, when the dry residue left in the teacup will be pure dry nitrate of silver.

Notes and Jottings.

No. II.

Experiments on Dry Plate Photography suggested.—Remarks on "Cocking" the Camera.

In the report of the Experimental Committee of the South London Photographic Society on the dry processes, Mr. Borchert alludes to the effects of what he terms "cleansing liquids" on the plates. He employs a solution of ammonia to dissolve out all salts of silver in the film, excepting the iodide and the bromide. By acting on this suggestion, we are inclined to believe that some experiments of an interesting nature might be conducted. At all events we purpose directing our attention this way, and as many of the readers of this journal are fond of experimentalism, we invite them to take up the subject and favour us with the result, in the hope that we might advance another step towards the elucidation of this important question. We throw out the following hints for those who may wish to pursue the matter:—

After washing the sensitized plate in common water, a portion of the free nitrate of silver is thrown down as chloride, &c.:

By means of solution of ammonia (different degrees of strength may be tried), and afterwards washing in distilled water, we get rid of this chloride, &c., together with the sundry indefinite organic silver salts which are formed when old collodion is used, leaving in the film only iodide, or iodide and bromide.

From this point we start afresh, bearing in mind that some other salt of silver should be present besides the iodide.

Re-dipping in a weak silver bath—say 3 to 5 gr. to the oz.—draining, treating with a solution of chloride of sodium, and washing, we have a film with only iodide and chloride of silver in it.

In similar manner we can procure the presence of any other salt in lieu of the chloride. Now let us prepare a few plates on this principle, coat with some preservative, gelatine for instance, and when quite dry, expose, and carefully note the comparative results as regards sensitiveness, density, &c., so as to arrive at answers to the following questions:—

What are the properties of a film containing only iodide and chloride of silver? It is generally stated that the chloride produces want of intensity, but that the plates keep well.

In like manner, what is the effect of bromide with the iodide?

The same with acetate, or citrate, which are usually stated to give greater intensity?

Many other questions will naturally arise, but those given will serve to point the direction to which experiments should tend.

Amongst other questions mooted in Mr. Rothwell's paper, read at the November meeting of the parent society, is that of the effect obtained by "cocking" the camera. Every photographer has at times been unwillingly obliged to esort to this "dodge," when his point of view has chanced to necessitate it. In landscapes of a rural character, the distortion thus produced is comparatively of slight consequence; but when we come to views in which are perpendicular lines, in a row of houses for instance, the case is different, the perpendiculars converge so that the buildings are represented wider at the bottom than at the top. It is true that to the eye the perpendiculars do appear to converge, nevertheless, for certain reasons which we need not enter on here, they must not be so rendered on a *plane surface parallel to those perpendiculars.*

The plan to avoid "cocking" most familiar to the photographer is, first, to get the camera perfectly level, and then to move up the lens by means of a sliding front. Another method is to use a swing back; in which case the camera may be "cocked," but the ground glass must be kept in a perpendicular position.

The ordinary swing back involves the employment of too cumbersome an apparatus for the out-door work of an amateur. Mr. Shadbolt has, however, lately introduced the plan of moving the lens instead of the back of the camera, and thus, by a little ingenuity, almost any apparatus can be made to equal, indeed, in our opinion, to surpass the old stage-coach swing back. A camera, manufactured by Mr. Meagher, was recently described in these pages, with a very simple contrivance to obtain the same effect.

Many of our "practical" readers don't understand, and don't care to bother themselves about the rules of perspective; but we would nevertheless ask them to note this single one, that *when the plane of delineation, otherwise the ground glass, is kept strictly parallel to the building to be drawn, the perpendicular and horizontal lines in the object will be projected as perpendicular and horizontal on the the focussing screen.* Hence the following conclusion:—

By first levelling the camera, the plane of delineation is placed parallel to the object to be drawn; and keeping the body of the camera stationary, we may move the lens in any direction, supposing it mounted after Mr. Shadbolt's plan, without producing distortion of the perpendicular and horizontal lines.

It will, however, be obvious that as some parts of the ground glass will be more or less distant from the proper focus of the lens, the smallest possible stop must be used in order to get sharpness. Michael Hannaford.

RESEARCHES ON THE ACTION OF LIGHT ON BODIES.—Intensity of Emitted Light.

BY M. EDM. BECQUEREL.

When a body is struck by a bundle of luminous rays, the molecules of this body are put into a state of vibration, and independently of the rays reflected and transmitted, they produce heat, light, sometimes chemical action, and perhaps also other molecular effects than those now under consideration, and which are not immediately appreciable. But on account of their diversity, these effects can be only partially studied, and if the calorific actions have formed the subject of important labours, those of phosphorescence have not, nor even taken that direction.

Having in previous essays studied the composition of the light emitted by bodies by virtue of their own action, and after the previous influence of luminous radiation, it became important to compare the intensity of this light with that of the active rays in the various circumstances of the experiments.

When a body, after being submitted to the action of light, is placed in obscurity, the intensity of the light it then emits immediately decreases until the molecular equilibrium is established as before insolation. But the question is, in what manner this extinction is produced independently of the refrangibility of the rays emitted? Are all bodies submitted to the same laws? What is the total action received by each body when the exciting luminous intensity of a given refrangibility changes within determined limits? On the other hand, the molecular state of a body does not change the composition, but only causes the intensity of the light emitted by this body to vary, by virtue of its own particular action, we may ask what are the molecular changes which can thus modify the state of the bodies? Such are the important questions which the use of the phosphoroscope permits us to put, and which are analogous, which have treated of cooling and of the quantities of heat which bodies can absorb when submitted to the action of calorific radiation; these questions concern the molecular constitution of bodies, and give valuable indications as to the manner in which the action of light is communicated to the molecules of matter, and consequently upon the luminous agent itself.

I first occupied myself with the construction of a photometer, which enabled me to compare the luminous intensities of bodies placed in the phosphoroscope; this apparatus, previously described, is founded on the effects of double refraction; its use, together with that of different phosphoroscopes described in my previous labours, have led me to the following conclusions:—

1st. When an impressionable body is submitted to the action of light, during this action it acquires after, generally, a very short time—but which depends on the luminous intensity, and the nature of the body—a state of equilibrium, in virtue of which it emits rays, *the intensity is in proportion to the intensity of the exciting rays.*

2nd. The intensity of the light, apart from its colour, does not exceed one or two millionths of the intensity of the exciting light; it will be much less with bodies that are but slightly impressionable.

3rd. When a body, after a previous insolation, is suddenly placed in obscurity, it emits rays, the intensity of which decreases more or less rapidly according to the nature of the body.

When the emission of the perceptible rays is of short duration, and generally less than a second of time, the law according to which the loss of the light is effected is such that the difference between the logarithms of the luminous intensities, taken at different times after the origin of the distinction, is sensibly proportional to the difference of these same times, whatever be the intensity of the exciting light.

This conclusion can also be expressed by saying that the velocity of the extinction is independent of the intensity of the incident light, and proportional to the intensity of the light emitted, and as the law which appears to follow the luminous extinction of the body is the same as that of the cooling of the heated bodies, when the difference of their temperature and that of the ambient air is very small.

4th. The measure of the velocity of the loss of light permits our determining for a certain number of bodies, *the relation of their emissive power to their capacity for light.* With alumina this relation remains palpably constant, whatever be the molecular state, whether the body be crystallized, melted, or pulverized, and although the maximum intensity of the light emitted at the commencement of the extinction be very different.

The law of extinction permits also of determining for the bodies comprised in the preceding category (3rd conclusion) the total quantity of emitted light, that is, the sum of the action received by the body for a given intensity of the incident rays.

5th. When the impressionable body, suddenly placed in obscurity, assumes different tints in succession, that is to say, that the differently refrangible rays are of unequal duration (*Ex.:* diamond, fluoride of calcium, &c.), and that the luminous emission is of a certain duration and exceeds a second of time (*Ex.:* terrous alkaline, sulphides, &c.), the preceding law is no longer applicable. It is possible that the difference which exists between the results observed and those deduced from calculation, according to the law enounced in the third conclusion, are due to the differently refrangibles, so that the rays of the same colour emitted by the body, have unequal durations, and consequently different velocities of extinction. In all cases, between certain limits, the results of the experiments are very well represented by means of an empirical formula; $i^m (t + c) = c$, in which i is the intensity of the light emitted after a time; t, that which is emitted at the origin of the extinction being:—1. c a constant coefficient, and m an exponent which varies between $\frac{1}{2}$ and 1, according to the nature of the body.

6th. According to preceding results, we find that for substances which give a luminous emission of long duration, the velocity of the loss of this light varies more rapidly with the intensity of this light than in bodies in which the persistence is of short duration, and that between the limits of the experiments this velocity is evidently proportional to a power of luminous intensity comprised between $\frac{3}{2}$ and 2. The formula indicated above permits of calculating also what is the total quantity of light emitted or absorbed in giving rise to the effects of phosphorescence here studied.

We can only explain the long duration during which these substances shine by saying that they receive a greater amount of the action of the exterior light than do those bodies which extinguish it rapidly.

7th. The results of experiments made with bodies which emit light in obscurity during a long period of time, permit of our showing with what a marvellous faculty the organ of vision is endowed, in that it can distinguish and compare the slightest variation of intensity in the feeblest light.

If we take as a term of comparison, the intensity of solar light, when the sun is highest above the horizon, at the period of the summer solstice, the sky being clear, we then find that luminous green sulphide of strontium, placed suddenly in the dark after being insolated, emits luminous rays of less and less intensity, and which may also be compared with an artificial light after an hour and a half. After the lapse of this time, the intensity of the rays emitted is to that of the incident solar rays, as 1 : 10″.

Beyond this limit direct comparison is become impossible, but we still continue to perceive light during more than a day, although during this interval of time the intensity of the rays emitted by the insolated solar body has always been diminishing. We can, nevertheless, value approximatingly the feeble intensity of the rays emitted: if we suppose that the solar rays are attenuated so as to have no more than a millionth of their original intensity, in this state they will be ten million times more intense than their light, which is still distinct after a sojourn of the sulphide of strontium thirty hours in darkness. Phosphorus, also, continues luminous after this interval of time, but it is impossible to follow in a satisfactory manner the changes it subsequently exhibits.

These results show how far we can go in the study of the light emitted by bodies, even when the effects are very feeble, and between what distant limits the organ of vision is impressionable, and can compare the effects it perceives.

8th. The action of heat upon bodies rendered luminous by insolation is manifested temporarily or permanently; its temporary action consists in this, that by the elevation of the temperature, the refrangibility like the intensity of the light emitted after insolation changes, and in that the luminous effects diminish, and even cease, commencing at a certain degree. It seems that the causes which tend to scatter the molecules of the bodies, each enfeeble the power they possess of emitting rays by its own action after insolation, as on the other hand we know that gases and fluids, except under special circumstances, do not generally give rise to appreciable effects.

Heat may also act by modifying solid bodies in a permanent manner, and in this case, the action of an elevated temperature increases the intensity of the light emitted after insolation, when this body has resumed the ambient temperature.

9th. The facts hitherto observed, show that the *intensity* of the light emitted by a body when it has been exposed to light, is essentially variable, and depends on a molecular arrangement, which varies according to circumstances which we cannot always appreciate; but the *composition* of the light emitted, together with the law of its emission, remain on the contrary, constant for the same body, and depend on the nature of the latter. This constancy proves that the phenomenon of luminous emission, by its own action, is a phenomenon depending essentially on the nature of the body: and that it is not possible to refer some of the effects observed to a mixture of foreign substances. Moreover, the effects exhibited by crystalline bodies obtained at low temperatures, and always identical with each other, effects which are such that the intensity and the composition of the light remain alike, place this assertion beyond doubt.

10th. It has been assumed thus far that the exciting luminous rays fall perpendicularly upon the surface of the body; but if the rays are more or less inclined, then the intensity of the transmitted rays vary according to known laws: the luminous effects produced by bodies after insolation vary proportionally between the same limits, and as before demonstrated. I intend in the course of these researches to give my attention again to the absorbing power of bodies for light, as well as the modifications which these bodies can undergo by means of mechanical or physical effects, so as to exhibit an emission of rays varying in composition and in intensity.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 2nd January 1861.

To whom the honour of first applying collodion to photography is due, is a matter of dispute, which it is desirable should be settled once and for all. It lies between the late Mr. Scott Archer and Mons. Le Gray. In searching the annals of photography, M. Humbart de Molard has met with certain data, which would seem to substantiate M. Le Gray's claim to having made the first suggestion of applying collodion; and, as this array of facts possesses at the present time unusual interest, I may be permitted to quote them.

1849. In M. Le Gray's *Traité*, published in this year, p. 90, is the following passage:—

"I also obtain a very good negative paper with the following alcoholic solution:

§ 34	Alcohol, pure or 36° ...	1000 parts
	Collodion	10 „
	Iodide of potassium ...	10 „
	Cyanide of potassium ...	1 „ ."

1850 (June). M. Le Gray's pamphlet, p. 42, Appendix:

"I am working at the present time a process *on glass* with methylfluohydric ether, fluoride of soda and potassium dissolved in alcohol at 40°, mixed with sulphuric ether, and then saturated with collodion. I next produce a reaction with acetonitrate of silver, and I obtain a picture in twenty seconds in the shade. I develope the image with a very dilute solution of sulphate of iron with great rapidity. Ammonia, bromide of potassium, exhibit very great variations in promptitude. As soon as my experiments are completed, I shall publish the results in an appendix. The application to the glass is very easy.

"The same reagents employed with albumen and dextrine also give very prompt and excellent results.

"I have also experimented with a mucillage produced by a fucus, which seems to me very promising.

"I hope soon to be able to obtain a portrait in three or four seconds."

This pamphlet was translated and published in London in 1850.

In 1851. *Art Journal* for July. Mr. Horne makes a communication respecting the obtaining photographic pictures on collodion by Mr. Fry, to whom the idea of the process is attributed.

On the 20th of Nov. 1851, Mr. Scott Archer made his first communication to the *Athenæum*, and on the 20th of Dec. following he writes again, stating that he has perfected the process by using pyrogallic acid as a developing agent; but this suggestion had been made by M. Regnault, in *La Lumière*, Feb. 9, 1850.

In 1852, *Athenæum*, Jan. 3. Messrs. Fry and Archer dispute with each other the priority of applying collodion to photography.

In March (1852), Mr. Bingham published a supplement to his *Photogenic Manipulation*, in which he maintains *his* claim to priority in the application of collodion against both Messrs. Fry and Archer, and states, that if his results were not at first satisfactory, it was owing to his not having employed pyrogallic acid as a developing agent as advised by M. Archer.

Therefore, if documentary evidence be of any value, the honour of first applying collodion to photography is unquestionably due to M. Le Gray. If it be asked why he allowed his discovery to fall into abeyance? he answers, that at the time of making it he received a commission from the French Government to make a photographic tour in the Holy Land, and that during his absence his suggestion was adopted by others, while he was necessarily confined to the waxed paper process.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting was held on the evening of Wednesday, the 26th of December, at Myddelton Hall. Mr. SHADBOLT presided.

The minutes of the previous meeting were read and confirmed.

Mr. SAMUEL BOURNE, of Nottingham, a gentlemen with whose exquisite productions many photographers are familiar, was proposed and elected a member of the society. Two very fine photographs by Mr. Bourne were exhibited by Mr. Nicholson; one an architectural picture, the other a large vignetted landscape, consisting of wood and water, a scene in Dovedale, was one of the finest and most artistic photographs we have seen, and elicited much admiration.

The CHAIRMAN called attention to the photograph selected for presentation among the members. The picture is a 10×8 by Wilson, and is entitled "The Mill." As a photograph it is faultless, and as a picture possesses much merit, marred, however, in our estimation by the number of straight lines and stiff angles in the mill, which gives the picture its name, and which forms a prominent object in the foreground.

In the absence of any paper for reading or discussion, the meeting resolved itself very literally into what a contemporary recently styled all photographic societies—a "gossiping club." The conversation first turned on the Fothergill process, by which the negatives were taken from which Mr. Bourne's specimens were produced.

Mr. NICHOLSON remarked that Mr. Bourne used chloride in his albumen, and notwithstanding that Mr. Shadbolt had objected to its use, derived from it the most satisfactory results.

The CHAIRMAN remarked that his objection to a chloride was only relative; not that he regarded a chloride as bad, but that he thought a citrate or phosphate for the same purpose was better. It was impossible, however, to speak of one element in a process without relation to the whole. Much depended on the collodion used and the presence or absence of a bromide in its preparation.

Mr. NICHOLSON remarked, in relation to some observations on washing, that Mr. Bourne washed a ten by eight plate fifteen minutes.

Mr. G. WHARTON SIMPSON asked if that washing was before the application of the albumen or after, as its importance entirely depended on that point.

Mr. NICHOLSON said it was before the application of the albumen, and another unlimited washing afterwards.

Mr. HILL remarked that Dr. Ryley had denied the possibility of obtaining a picture if all the free nitrate were washed away before the application of albumen.

The Chairman said that much would depend on the presence of a bromide in the collodion. If thorough washing immediately after sensitizing were given to a plate coated with simply iodized collodion, a good negative, would not be obtained.

Mr. Simpson observed that in that case, at all events the sensitiveness would be very much diminished.

After some further conversation on the subject,

Mr. Simpson called attention to a curious fact in connection with the keeping of collodio-albumen plates, the details of which he had learnt from Mr. Ackland, at Messrs. Horne and Thornthwaite's, where he had seen some transparencies printed from negatives. The details had appeared in The Photographic News. (See p. 408 in our last volume.)

The Chairman said he did not think decomposition was chiefly brought about by high temperature, unless there was also a good deal of moisture present.

Mr. Simpson was aware that moisture would materially facilitate decomposition; but high temperature alone, would, in the course of time, he thought, usually assist in the deterioration of an excited plate. An excited collodio-albumen plate would usually keep better in winter, when the temperature was low, than in summer, when it was warm, and generally dry, than in winter.

Mr. Hill remarked that Mr. Moens had been successful with collodio-albumen plates, and found them keep well during his trip up the Mediterranean.

After some further observations the subject dropped, and another topic of conversation was started by

Mr. Hill, who said he had brought some specimens of albumenized paper, which had caused him great difficulty. Since the new method of preparing paper came into operation he had not met with any samples of paper so satisfactory as those prepared for the old process, and he had had several cases of "mealiness" occur. He perceived this mealiness in some of Mayall's portraits of the royal family. He found also that the albumen came off in some cases, and in one case, the albumen had came off altogether. He had sensitized the paper in a new bath of 65 grains to one oz. of water, slightly acid. Measly red spots sometimes made their appearance, which he thought was owing to the removal of part of the albumen.

The Chairman asked whether it was an established fact that there was a new method of preparing the paper?

Mr. Hill said it was acknowledged by those who sold it, that they had a new method of preparing the paper for the alkaline gold toning process. The reason for the defect was alleged to be the use of too much soda in the toning bath; but he had tried phosphates with no better result.

Mr. Simpson said, Mr. Hughes contended that there was nothing new in the method of preparation, but that any difference existing was due to the paper itself.

The Chairman thought Mr. Hughes had not established that.

The Chairman remarked that Mr. Sutton had been recently drawing attention to what he called a new method of albumenizing, by the addition of acetic acid. That was no novelty, for a year or two ago he had himself drawn attention to that method. It was not new then, for in 1854 and 1855 the Printing Committee of the London Photographic Society endeavoured to ascertain the effect of the introduction of various substances into the albumen for the purpose of getting an even coating of albumen on the paper. The result, in his opinion, was that the introduction of acetic acid was highly detrimental instead of beneficial, whereas the introduction of ammonia materially assisted in getting a good even film. This was the natural result, for ammonia being an alkaline fluid, increased the fluidity of the albumen, and being volatile, was, in the process of drying, got rid of; whereas acetic acid uniting with the alkali in the albumen formed a stable salt.

Mr. Simpson observed that it was odd that Mr. Sutton should call this method a new one, because some time ago, if his memory served him rightly, that gentleman had given the same method for obtaining an even coating and avoiding streakiness.*

The Chairman said the fact was that amateurs must albumenize their own paper, and show the way first of all, and then they would get professional albumenizers to do it commercially.

Mr. Lander said he had met with mealiness, but not through the albumen leaving the paper.

Mr. Hill showed one sample in which there was considerable loss of surface after exciting, but no apparent removal of albumen.

Mr. Simpson said that might be owing to the removal of the artificial surface given by the rolling.

The Chairman said that was an additional objection to rolling. He asked whether Mr. Simpson had ever tried acetic acid with the paper?

Mr. Simpson stated that he had used paper that smelt of it, but he had perceived no bad effect. Some of his friends had used acetic acid to get rid of the streakiness, but had not succeeded in doing so. It might be that too small a quantity had been used.

Mr. Hill observed that many of Mayall's and Claudet's *cartes des visite* showed signs of mealiness.

Mr. Simpson said he had a very strong suspicion that they were not toned by the alkaline gold toning process, as some of them were turning yellow already.

Mr. Hill.—Some are turning green. It was said that if the alkaline gold toning process were used these mealy marks would not occur.

Mr. Simpson said another point to be remembered was, that it was not always known by whom the pictures exhibited and sold were done, as the originals were frequently copied, and the copies sold as originals.

Mr. Hill said he had received a letter from a friend at Port Natal, relative to using arrowroot as a preservative. He dissolved a portion of arrowroot in boiling water, to which he added alcohol, and he then used it in exactly the same way as the Fothergill process: it answered very well.

Mr. Simpson said several similar substances had been tried with success.

The Chairman said there was another subject they might take into consideration—Mr. Heisch's recommendation to retain the old toning bath instead of the alkaline gold toning process. Mr. Heisch said, in the first place, that the latter could not be better than the former, because pictures toned by it faded. But he had omitted to say, at the same time, that even when thoroughly washed many pictures toned by the old gold and hyposulphite of soda process also faded. That could not be proved with regard to the alkaline gold toning process.

Mr. Hill attributed the fading experienced in the alkaline gold toning process to errors in the fixing, and not to the toning.

Mr. Simpson thought it was an error to suppose Mr. Heisch considered the old one best. Mr. Heisch only said he was not sure that the new process was better than the old. All that he had proved, however, was, that certain gold toned prints had faded, but he did not prove what had occasioned the fading. Mr. Heisch said that the carbonate of soda and chloride of gold were introduced, whilst in the texture of the paper, into the hyposulphite of soda, and that the decomposition would take place as much in that way as in the old process.

The Chairman did not consider Mr. Heisch's reasoning good, because it did not at all follow that the same results would follow when the substances came into contact in so different a manner from that in which they did in the old process. Everybody knew the difference between pouring the gold into the hypo and the hypo into the gold.

Mr. Simpson observed that chloride of gold would not cause that decomposition which set free the destructive element, sulphur, it was the presence of acid in the chloride that produced that effect. Very likely the fading referred to was occasioned by want of care in the manipulation. Fresh hyposulphite of soda ought to be used, not that charged with nitrate of silver.

Mr. Hill said Mr. Heisch appeared to consider the old process more permanent.

Mr. Simpson.—Mr. Heisch merely suggested the question, as to whether it had been given up without sufficient consideration.

After some further remarks on toning with iodine, which the Chairman remarked gave a tone but was not permanent, a paper by Mr. Hughes was announced for the next meeting, and the proceedings terminated.

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* We find on reference to the number of *Photographic Notes* alluded to, what we suspected at the time, but could not assert in the absence of any immediate means of verification, that there was a slight misapprehension on this subject: Mr. Sutton does not bring this forward now as *new*, but as important, and not well known.

Photographic Notes and Queries.

The Albumen Dry Process.

Sir,—I beg to thank you for the insertion of my letter in your number of November 30, and I am obliged to your correspondents for their assistance. The frosted marks which appeared on my plates were visible immediately on leaving the bath, and therefore did not arise from the causes suggested by Mr. Russell and "An Amateur." I found the solution of my difficulty in Mr. Cramb's explanation. I was using an albumen too highly iodized for the strength of the bath, and by reducing the quantity of iodide I have once more perfect plates.

Permit me too add a few remarks on this process, and the "Taupenot" process. This latter is generally classed as a collodion process in which albumen is introduced as a preservative. I think in its original form it was clearly an albumen process, where the collodion plays a nearly inactive part in the formation of the image. This seems to be borne out by the fact that the result is nearly the same whether the collodion is iodized or not; and also that all the operations excepting the final exciting in the acid nitrate bath can be conducted in broad daylight. I do not pretend that either of these methods is suited to produce the *best* pictures, but good pictures will in either case result. Now with Messrs. Petschler and Mann's method of manipulation, and with Dr. Ryley's hot water variation, no picture whatever would result under similar circumstances, *i.e.*, with uniodized collodion, or working in daylight; therefore, I think these methods cannot be considered properly, as they have been hitherto termed, "modifications of the Fothergill process," which is, in the proper sense of the term, "a collodion dry process."

On the Continent, dry processes with collodion are comparatively but little used; wet collodion, paper, or albumen are mostly employed for out-of-door photography abroad. There can be no doubt that wet collodion is the medium with which the most perfect pictures can be produced. Next to this comes albumen.

It is difficult to conceive, in a country like this, where there are so many first-class photographers, who aim at producing the highest effects their art is capable of, that dry process which is the most capable of rendering them should be so generally neglected, that its practice should form a rare exception. But I am quite assured of this, that it has never been *properly* tried, and when judged upon its merits, laid aside for any dry process involving the use of collodion, therefore I am inclined to believe that its neglect arises from photographers generally being unacquainted with its qualities, or entertaining an erroneous idea of the ease and certainty of its manipulation. I am strengthened in this belief from the extensive employment of the "Taupenot" process, (which, of all other dry processes, I consider approaches nearest in excellence of results to the albumen process). The manipulations for "Taupenot's" are more complicated and numerous than those of any other dry prosess with collodion, and the sensitive plates have no great keeping qualities, yet the process is more used than any other, *because the resulting pictures are superior.* And if it were well ascertained that with a simpler manipulation, a cheaper material and equal certainty, a still higher class of effect could be attained, I think the "albumen dry process," which fulfils all these conditions would be very extensively practised.

I will now compare the "Taupenot" and the "albumen" processes in the various stages, based on my own experience of each.

Preparation of the Coating Material.—Here, at the outset, the comparison is much in favour of "the albumen." Prepared by nature, a constant compound, it may be procured ready for use, in the meanest village of the civilized world, alike at the command of the country photographer as of the dweller in cities: cheap, clean, invariable. In addition to this material, the "Taupenot" requires also collodion, the preparation of which is uncertain and difficult, variable in quality, unstable, and costly, to be procured only at certain centres, or to be manufactured by the photographer at a great expenditure of time; in either case without any certainty of uniformity of action.

Coating and Sensitizing.—An idea appears to prevail that coating a glass plate with albumen is attended with more difficulty than coating with collodion; this is not the case. If the albumen be not less than three days old it will flow evenly and easily, requiring no more skill than collodion; and if the excess be poured off into a second measure and strained through sponge or flannel before using again, a perfectly clean plate is always attainable, with greater certainty than with collodion as it is generally handled, by pouring off the excess back into the bottle in use. The "albumen" has one coating: the "Taupenot" has two. The "albumen" has one sensitizing, one bath solution, one washing, one drying; of each of these, also, the "Taupenot" has two. Therefore, in the preparation, the "albumen" is simpler than the "Taupenot."

Keeping Qualities.—I have never kept "albumen" plates longer than a month, but they are quite unimpaired in that time, and I see no reason why, when they are deprived of all the free nitrate by a chloride, they should not keep for a much more considerable period. I find that the limit of time for *the best results* on a "Taupenot" plate is about three weeks: others have succeeded in keeping them longer, but I gather that this is a very general experience.

Exposure.—I am less able to give an opinion on this part of the subject than on the rest, as my experience scarcely coincides with what I read respecting the sensitiveness of the "Taupenot" plates. I find it variously stated that an exposure of 15, 20, or 30 seconds for "Taupenot" plates, with a stereoscope landscape lens, is sufficient for a good negative. I rarely can take a satisfactory picture by that process, with a stereo lens and pea-stop, under 60 seconds, and I should say that the average was nearer 1½ minutes. This also I find to be the average necessary exposure for an "albumen" plate, with the same lens. I have no doubt that in the hands of those who work the "Taupenot," more rapidly than I, the "albumen" would work at the same increased rate, as the various means employed to accelerate the one process are equally applicable to the other.

Development of the Image.—Gallic acid, pyrogallic acid, or iron may be used for both processes; but with all of these the "albumen" plate, will bear more prolonged development than the "Taupenot," and no matter how long the action of the reducing agent is continued on the "albumen" plate, the parts where no light has impinged, will remain totally colourless and clean; and the solution will not be decomposed, so that it has not to be renewed. The picture also with the "albumen" never requires to be strengthened afterwards by other means.

The Picture.—I unhesitatingly assert that the picture obtainable upon "albumen" dry plates is only second to "wet collodion," and very little inferior; and that the "Taupenot" process as generally practised, is nearly as good, but not quite.

I fear I have far outrun the limits of your patience and that of your readers, but I think it is useful that the qualities of "albumen" should be better known, and that end will be best gained by publicly discussing and comparing its merits with those of other processes.

If what I have written should induce any of your readers to lock up their collodion bottles for a week, and give albumen a fair trial, I am convinced that they will not be in a hurry to return to the former in any form of *dry process* for out-of-door landscape photography.—I am, yours faithfully, F. Richards

A Hint to Amateur Mechanics.

Mr. Editor,—In reference to the answer given in your last number to G. G., on the subject of what he terms, "pluffing up," he and other of your amateur mechanics may feel a hint from a brother chip of some experience, useful.

The source of the evil complained of is in the tendency of the grain of all woods, and especially soft ones to be rubbed down in planing, however sharp the tools may be, though of course, the duller the plane the worse will be the effect, and where a file is used, as is frequently the case in fancy work, it is still worse.

The remedy is easy: before putting on the polish or varnish as the case may be, wet the surface slightly with hot water and a sponge, this will cause the sunk grain to swell up, or, as it is technically called, "to be raised," when dry, rub down the raised grain with fine glass-paper, rubbing as much as possible in a direction meeting the raised particles; repeat this till the grain no longer rises, when the finest polished surface can be produced.

In very thin articles it is sometimes of advantage in order to prevent warping, to raise the grain with the varnish or polish, rubbing down as before, but it is much more difficult to get a good surface in this way.

The softer mahoganies and walnut wood, both much in use for photographic purposes, are particularly liable to the evil G. G. appears to have met with.

An Amateur Mechanic and Photographer.

Talk in the Studio.

The Proposed International Exhibition for 1862.—This may now be regarded as a positively coming event. Most of the eminent manufacturers of the Continent are preparing for it, and those of our own manufacturing districts feel that they cannot afford to neglect the opportunity. Some 670 names are now on the guarantee list, at the head of which stands that of the Prince Consort for £10,000. The site is fixed on the estate of H. M.'s Commissioners of 1851, at South Kensington.

The New Bronze Coin.—It may surprise our readers to learn that, from one press only, not less than sixty of these are produced in a minute.

The New R.A.—Mr. G. G. Scott has been elected at the Royal Academy in the room of Sir Charles Barry.

Signing the Treaty of Peace at Pekin.—A photograph of this scene was secured by Signor Beato, the mandarins very willingly remaining still for the purpose. The great quantity of red and dark purple in the decorations of the species of shed under which the affair took place, and in the costumes of the Chinese must have been disadvantageous.

Backgrounds.—An operator of eminence informs us that one of the best means for obtaining varities of light and shade in his background is to have it so arranged with cords and pulleys that it can be sloped one way or the other at any angle, thus securing either a soft gradation of light, or of dark from the top downwards, according to the light or dark character of the object to be relieved.

A Glorious Failure.—We are happy to inform our readers that the proposed formation of an asylum for the orphans of artists, although funds were very liberally forthcoming, has turned out a failure, being relinquished for this very sufficient reason—*there are no orphans of artists requiring such a charity!*

Stothard.—The works of this very eminent artist will be exhibited by his son, Mr. Robert Stothard, early in the Spring.

"An Honourable Member."—The member for Brighton, Mr. White, whom our esteemed friend Mr. Hughes would certainly denounce as uncivilized, has recently been misleading the working men of Plymouth by rampant denunciations of government art-patronage, stating, among other strange and novel things, that the Prince Consort has distributed among his own personal favourites no less than £78,000, "extracted out of the pockets of the working classes." Truly White is black in the eye of all truth-lovers and art-appreciators.

Somewhat Alarming—Hot-Water Process.—In a recent lecture upon photography, delivered by our contributor, Mr. Wall, the following amusing anecdote was told. Our readers are perfectly aware that it is a practice with some of our operators to expedite the washing process by using hot water. A certain Mrs. G—, a timid, nervous, and very absurdly suspicious old lady, had sat for her portrait, which was promised for a certain day. Now, it so happened that, from the unpropitious state of the weather the print was only taken out of the pressure-frame an hour or so before the ancient dame came puffing up the stairs. Just as she reached the landing-place of the first flight, the angry operator called out loudly to his neglectful printer—"Now, ——, look alive, *take hold of that old Mrs. G—, and shove her into the boiling water!*" I leave you to imagine, said the lecturer, with what intense horror the poor old lady hurried tremblingly down the stairs, and her glorious sensation of safety and delight when she found herself once more in the street.

Photographing on Wood.—A very beautifull engraving produced by a new process of photographing on wood has been published as an illustration to a work translated from the German and entitled "Lyra Germanica." It is a copy of Flaxman's celebrated *basso-relievo* "Deliver us from Evil," and was printed and engraved by Mr. Bolton from Mr. Leighton's negative.

Rock Inscriptions.—Mr. Bentley announces a new work called "Sinai Photographed." The rock inscriptions which are supposed to have been executed by the Israelites who came out of Egypt.

PHOTOGRAPHIC MEETINGS IN JANUARY.

London Photographic Society	Tuesday, 8th.
South London	Thursday, 17th.
North London	Wednesday, 30th.
Blackheath	Monday, 21st.
Edinburgh	Tuesday, 8th.
Birmingham	Tuesday, 29th.
Chorlton	Wednesday, 9th.

To Correspondents.

B.—There is no fault in the toning of the specimen sent, nor indeed could the fault be in the toning bath since you state that the print is flat and feeble on first coming from the printing frame. You may hold it as a rule that if the print lacks vigour then, no subsequent treatment will make it brilliant. We think you must be in error in one of the two points, either the negative lacks vigour and intensity, or the sensitizing bath is very weak. Neither the paper nor the toning appear at fault. 2. It is purely a matter of taste whether albumenized or plain paper be used for portraits, and tastes will differ. Some of the finest results we have seen lately have been on arrow-root paper. 3. For a dark background sheeting calico painted a suitable grey tint, either in distemper, or in oil and "flatted."

Juvenis.—The best plan is always to use fresh hypo for fixing, of a strength of not less than fifteen or twenty per cent. 2. A print only partially fixed will generally show some opaque-looking patches on holding it up to the light; these consist of undissolved hyposulphite of silver. 3. Too frequent application of citric acid to decolourize the silver bath, would undoubtly make it acid, by the formation of citrate of silver, and the liberation of nitric acid. This may be neutralized with carbonate of soda. Remember, however, there is another evil to be avoided, the frequent addition of citric acid is a very wasteful process: the citrate of silver is a tribasic salt, and for every part of citric acid added, three parts of silver are taken from the bath to combine with it. If, however, instead of filtering each time, and removing the excess of citrate of silver, it be shaken up each time the solution is returned to the bottle, and then allowed to subside, and the clear solution carefully decanted off, when required for use, it will, we apprehend, serve to decolourize the bath several times. Try the plan suggested by Mr. Fry, in our pages some weeks ago.

Walter Woodbury.—The account of your interesting trip shall appear.

Charles Shone.—The information as to the grinding and turning of a speculum for a telescope, would occupy more space than we can afford. We must refer you to an optician.

F. J. G.—Thanks for your hints. The passage to which you refer, was misplaced, by mistake, in a few copies

An Amateur.—You will find an excellent formula for the manufacture of collodion, suitable for either wet or dry processes, in the Photographic News Almanac for 1861. The cost of a collodion filter is, we believe, about five shillings. It may be obtained through most photographic houses. Careful decanting, after sufficient subsidence, will be found, generally, to answer the purpose.

J. G. L.—1. Members are elected in the London Photographic Society b hallot. You must be proposed by one member who knows you, and seconded by another. The entrance fee is one guinea, and the annual subscription one guinea. The annual meeting is in February. You will receive every particular on writing to the secretary. 2. In applying the *Sochnee* varnish, and all spirit varnishes, the plate must be warmed gently, and the varnish applied whilst it is warm. It must then be held near the fire until it is set. 3. Opal glass will not injure the bath; but it is too opaque for transparencies, except where bright artificial light is used. 4. We shall shortly have some articles on printing transparencies. 5. If the stereo negatives are taken with a twin lens camera, they or the prints must be cut and transposed. 6. There is no need to add ammonia to albumen, for coating the glass, prior to the application of collodion, but it will not be injurious as the ammonia will evaporate as the albumen dries. Your sugestion regarding the volume shall receive due attention.

J. Brown.—1. Your silver bath must now, if we understand you rightly, contain fifty or sixty grains to the ounce, a most unmanageable strength; and the iodide of silver having been probably precipitated during its treatment, you find that a coated plate instead of obtaining silver from immersion in the bath, is robbed of its iodine. Saturate the bath with iodide of silver, by leaving a large coated plate or two in for a short time, and dilute the bath to a strength of about 35 or 40 grains, and you will probably find all work satisfactory. 2. You may without risk add your collodion films to your silver residues. 3. You can buy a plate of looking glass better than you can make it.

F. E. G.—Give your negatives a final wash with distilled water before drying. Try another sample of varnish, and keep the varnished negatives as dry as possible. It sometimes happens that negatives are sadly impoverished by varnishing. Where a crystal varnish has been used, it is easily removed; but spirit varnish presents more difficulty. You may try to remove it with strong alcohol. Your only resource is to use a very strong silver bath to prepare your paper, and print by diffused light; you may get a little more vigour by this means. Regarding the sale of your slides, we cannot help you further than suggesting application to the various wholesale houses whose advertisements you may see from time to time. We believe the market is very full at present. Possibly by trying another sample of collodion, you may get the intensity you require; or you may add a little acetate of silver to the bath. We shall have pleasure in seeing your photographs; but fear that the demands upon our time will preclude the possibility of our entering into any lengthened comment upon them.

Fix.—You will obtain "depth of focus" by stopping down your lens.

X. Y.—The acetate of iron gives more intensity than the sulphate. You may use, in its preparation, either acetate of soda, ammonia, potash, or lead. The latter will require filtering.

J. S., Longton.—We purchased the brown paper to which we referred for backgrounds, at a paperhanger's shop in the Euston Road; the name and number we do not remember. The price, if we remember aright, was threepence per yard; the width was a yard and half; and any length could be had. We presume it is kept by paper-hangers generally.

H. T. B.—As your letter only arrives on the day of going to press, and requires a little consideration, our answer must be delayed until next week

A Constant Subscr.—See article on the manufacture and purification of photographic chemicals, in the present number.

Many articles in type, amongst which are the letters of Fairplay and others, are compelled, for want of space to stand over until next week.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to the Office, 32 Paternoster Row, London.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 123.—January 11, 1861.

VISITING CARD PORTRAITS.

We had recently the pleasure of inspecting some very charming specimens of the fashionable *cartes des visite*, or album portraits, which for delicacy, roundness, and brilliancy we have never seen surpassed. In examining these beautiful productions we were convinced that they owed their peculiar qualities rather to the artistic acquirements of their producer, than to any secret method of manipulation or peculiarities of process, and meeting the gentleman by whom they were taken—Mr. Lacy, of the Isle of Wight—at Mr. Wall's studio, we were gratified to find such a conviction verified. After posing his sitter, this artist's first care is to obtain such an arrangement of chiaroscuro as is consistent both with the peculiarities of his process, and the demands of artistic rules; no pains being regarded thrown away if they tend to secure good pictorial results.

One side of his glass room has a window of ribbed glass, through which a slightly diffused light falls upon the model. On the other side a much weaker and more diffused light finds its way through ground glass,* and, acting in the character of reflected light, penetrates and softens the deeper cast shadows, and gives a tender delicacy to those parts which retire from the stronger light on the other side. Although in the model the amount of shade may appear too much decreased by this method of illumination, the well-known tendency of photography to exaggerate the depth and intensity of the shadows fully makes up for such deficiency in the negative, and the resulting pictures possess an amount of roundness and relief, combined with delicacy, which every photographer of taste must very highly appreciate.

The soft gradation and tenderness of light and shade obtained by the above method is pre-eminently adapted for ladies' portraits, but where deeper shades and more vigorous half-tones are rendered desirable by the altered character of his subject, Mr. Lacy simply draws a curtain over the ground glass, and thus deepens the shadows by decreasing that which may, for the sake of explanation only, be called the reflected light.

In the course of a very interesting conversation, Mr. Lacy pointed out how many photographers frequently give a universally unpleasant expression to all their portraits, by simply using too strong and too direct a top light. The principal muscles which govern expression—the zygomaticus major and minor—under these circumstances give rise to strong deep shadows in a downward direction from the nostrils, and the angles of the mouth. The corners of the lips being lost in these dark shades, and these dark shades being thrown at an angle downwards, the latter appear really to belong to the lips, and the result is a lugubrious or sullen expression, which, combining with the deep dark masses in which the eyes are nearly lost, and the consequently apparent depression of the brows, horrify and shock sitters into strong denunciations of "those horrible photographs," and wound their self-love in a very unpardonable, unnecessary, and unmerciful manner.

The developing and intensifying processes used in producing the negatives, from which these exquisite pictures were obtained, somewhat surprised us; not because the method was novel or uncommon; but because we have rarely found it used from choice, being generally resorted to as a makeshift or succedaneum, where manipulatory skill is limited, or materials are insufficient, to produce a satisfactory result by the usual negative process: we refer to the use of bichloride of mercury and iodine. Mr. Lacy, however, uses this proces from choice, believing that it yields special qualities—peculiar sharpness and detail, so important in small pictures—unattainable by other methods.

His explanation of the rationale of this effect is as follows:—wherever density is obtained by an accumulated deposit of silver on the image, a certain amount of delicacy and sharpness is lost, the result being similar to what would be produced by moistening a very fine, sharply cut seal or cameo, and covering it with powder. However fine the powder or dust might be, a loss of sharpness would be the result, as the powder would adhere laterally as well as vertically, and thus thicken and destroy fine lines. By intensifying with mercury Mr. Lacy conceives he only obtains a vertical deposit which does not interfere in any degree with the delicacy and sharpness of the finest details. This question may be open to consideration, and might be decided by the aid of the microscope. The points to be determined by such an examination would be, whether, in the first place, the deposit of mercury be more strictly vertical than that of silver; and in the next place whether the molecules constituting the mercurial deposit are finer than those which constitute the silver deposit. Whether this be the case or not, there is no doubt but that in the next process of intensifying—which is effected rather by changing the colour than increasing the density, the mercurial deposit being turned yellow by means of iodine—the effect is obtained there without in any degree rendering the deposit coarser or less delicate and sharp, and it is to this fact, perhaps, rather than to much difference between the character of the silver and mercurial deposit, that the delicacy in the result is due.

Every one is familiar with the superior sharpness of albumen negatives; and this we are disposed to regard as largely due to the fact, that intensity is obtained rather by the non-actinic colour of the deposit, than by its accumulated thickness.

It must not be supposed that in the use of bichloride of mercury as an intensifying agent, the process usually known as "converting positives into negatives" is involved. Converted positives rarely yield satisfactory prints, the common result being bald, and flat, without detail or modelling. These pictures are exquisitely round and full of half-tone. Sufficient exposure is given to bring out every detail with full vigour: the pictures are then developed with a strong solution of iron, about fifty grains to the ounce, with a proportionate amount of acetic acid. When thoroughly developed by one application of this developer they are, after fixing and washing, intensified by bichloride of mercury, followed by a solution of iodide of potassium.

In giving this formula we would not be understood as recommending it for general use, as it is beset by many dangers. For the guidance of those who are desirous of trying it we would add one or two cautions. Unless judgment and skill guide its use, the results will inevitably be unsatisfactory. Sufficient exposure and development must be given in the first instance to ensure the perfect rendering of detail, or hardness and flatness must ensue. A very dilute solution of iodide of potassium must be used, or stains, &c., from unequal action of the iodine will occur. Better still, perhaps, will be the use of the iodine and mercury in one solution. Make a solution of bichloride of mercury, about twenty grains to the ounce, without any hydrochloric acid. To this add, by a drop or two at a time, a saturated solution of iodide of potassium, shaking the bottle each

* Or glass painted by a method to be found at page 226 of our last volume.

time until the precipitate of red iodide of mercury is dissolved. When sufficient is added, a portion of the red precipitate will remain undissolved, and the supernatant liquid is ready for use. If any tendency to stains or unequal action be found, the solution may be diluted with water. Finally varnish with a good bodied spirit varnish, so as to prevent, effectually, any contact with the excited paper and the mercurial deposit, or the prints will be spoiled, especially if the contact be long, from slow printing. This is important, and a "crystal" varnish, made from dammar in benzole, will be found an insufficient protection.

To return to Mr. Lacy's pictures, he uses a quarter-plate lens, *well stopped down to secure modelling;* but, as he himself says, "it is not to *lenses or processes only that we must look for any amount of pictorial success, but pre-eminently to the principles of art, more particularly such as regulate the proper arrangement of light and shade.*" A remark which, illustrated as it was, by the eloquent arguments of his own beautiful productions, we can but re-echo in these pages for the benefit of our practical readers.

DIALOGUE SKETCHES.—No. 5.—Nature's Art.

[From a "Photographer's Common-place Book."]

"Painting, like all other liberal arts, is reducible in a great measure, to certain generally received rules and precepts. And though these precepts, and perhaps all others that could be given, are alone (that is without some portion of genius) insufficient to produce a good artist; yet they will almost at all times prevent a man from being a bad one. They are the reflections of the greatest masters. They point out those rocks the student should avoid; and are, therefore, indispensible to his success. They facilitate his labours, and direct him in the shortest and surest road to perfection. They refine his taste, teach him to discover the truly beautiful in nature or art, and strengthen and confirm his judgment."

When one quotes another writer it is only right and proper to append that writer's name thereto; but from whence I copied the above extract into my Common-place Book, it don't say, and I don't know; so please to take it as a poor, nameless orphan of a quotation, which may belong to some mighty "somebody," or some poor, forgotten "nobody;" but of which you now know all that I can tell.

"Have you wet or dry plates?" said Lovetruth. "Wet," replied Process, and then we abruptly departed. As they have been waiting for us three weeks, I think it is time we rejoined them.

* * * *

Here they are then, just pulling up their "gallant steed" at the spot Process has selected for commencing operations.

Process.—Wo-o-o, Bob! Well, here we are; what do you think of the spot?

Lovetruth.—It is a charming one, indeed.

Process.—There's such a variety of scenery, you see. If you want water, there's a fine piece gleaming out among the foliage yonder. If you want trees, what can be finer than these clumps and groups, scattered so plentifully about us? Or, if you prefer distance, there's miles of it to be had from the top of that fine eminence. Now for the apparatus.

Lovetruth.—There's my picture [pointing]. Do you see the broad mass of shadow transparently veiling that beautifully varied group of trees yonder, against which a graceful birch-tree, in a gleam of soft light, stands so prominently out; and beyond which trees and hills retire behind the beautiful atmospheric curtains, until they melt as it were into the horizon, thus uniting sky and landscape into one gloriously harmonious whole?

Process.—Yes; but are you not afraid of so much shadow?

Lovetruth.—Shadow—the source of power and variety, contrast and brilliancy, breadth and repose; the very soul, as it were, of the picturesque—afraid of it; no! faith not I.

Process.—I so frequently find failures in attempts to secure a proper amount of detail in associated lights and shades, that I must confess that *I* am afraid of it. I have tried all processes for one which will render the obscure and the lighted portions of a picture with equal truth; and although I have *sometimes*, by *a mere chance*, been successful, I have far more frequently failed. The best method *I* know for the treatment of a subject containing much shadow, is to adopt a collodion containing a bromide, expose with great nicety in regard to time, and use an iron developer.

Lovetruth.—You remind me of a visit I once made, at our friend Newart's request, to a photographic meeting in connection with one of your societies. Upon this occasion several exquisitely beautiful photographs were exhibited, full of great artistic merit and eloquently expressive of the refined taste and high intellectual labour which had created them. Although, in themselves, these contained full evidence of all which constituted their great superiority to the general run of such productions, everybody present appeared to insist upon regarding them as the result of efforts purely mechanical, so that I heard no questions asked beyond these —"Whose collodion?" "How iodized?" "With what developer?" and "What sized stop?" and above all "With what *lens*?" and "By what *process?*" As if, forsooth, these mechanical means, in themselves, constituted the sole end of a photographer's ambition.

Process.—Surely, you don't deny the importance of such considerations?

Lovetruth.—No more than I deny the importance of th glorious press which produced the first printed copy of that grand old book, the Bible; although, it strikes me, the divine character of the Book itself would be none the better understood, or appreciated by merely studying the type in which its pages are "set up."

Process.—But what do you mean? If the process I have named won't secure an artistic picture, what process will?

Lovetruth.—I have seen genuine pictures produced by nearly every process I have ever heard of.

Process.—Where does the secret lie, then? In the lens?

Lovetruth.—No, in the operator. Let me illustrate my meaning. I have, in the view I am just going to photograph a specimen of nature's art, or in other words, of the quality painters term a breadth of chiaroscuro.

Process.—Which means, I think, the separation of the lights and shadows into separate masses, so as to avoid a spotty appearance.

Lovetruth.—Yes; providing you do not mean such an arrangement as I have sometimes seen described as breadth, in which one black mass of almost uniform density contrasts another light one with almost as little gradation. In the view I pointed out yonder, you will perceive that although the lights and more delicate half-tones, are all grouped about the middle ground and distance, and the shadows and darker tones are confined to the mass of delicately veiled foliage more immediately in the foreground, there is sufficient light carried into the one by that softly illuminated birch-tree, and of dark into the other by that distant group of trees, to constitute that which is one of the most important elements of breadth, viz., unity.

Process.—Excuse me; I am too eager for work to enter into that which is only theoretical; and besides which, I am really anxious to know by what *process* you contrive to get shadows in your photographs?

Lovetruth.—By what you will perhaps call no process at all, for it is by the aid of what you have just termed "only theory."

Process.—Well I can't understand you at all, Lovetruth, but go on.

Lovetruth.—And yet my meaning is simple enough. So simple indeed, that if your brains were not so crowded with lenses and processes, as to blind you to everything apart from them, you must at once discover it. Say your are taking the view before us. You use your bromised collodion, and expose with your usual care, timing the exposure to the quality of collodion and class of developer you are working with. Do not under-expose, so that whilst you are endeavouring to force out those details which give the shadows transparency, you quite bury all detail in the lights. You use an iron developer, I believe; if you subsequently intensify with pyro and silver, you can, by a little management, give a little more vigour to that part of the plate which requires it. As to the quality of unity, the birch and that group of rather distant trees in the light, which are sure to come out more or less dark whether they be in light or not, will secure that, and your "mere theory" thus becomes of no little practical value. Do you understand me now?

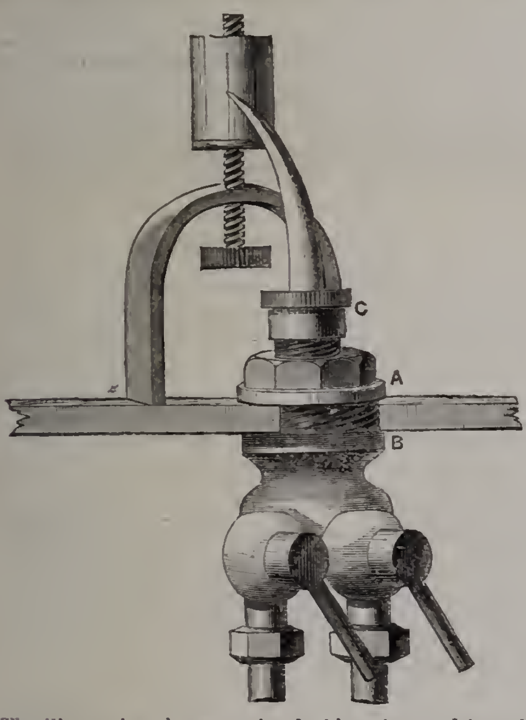
Process.—Hem! Upon my word I begin to think that I have been seeking "in process" what I wanted "in power," as Sir Martin Archer Shee, of the Royal Academy, said. I really am much obliged to you, Lovetruth.

Lovetruth.—Art exists in nature, and we have only to learn the art of seeing pictorially, to reproduce it in our paintings and our photographs. Excuse me, Process, if I am somewhat tedious in always talking *art* at you. There are *so* many to talk about these interminable *processes* and *lenses*, that I feel, while my remarks on such subjects can well be spared, that I am the more bound to speak upon that subject which is not only most needed, but of which I have a better understanding, simply because it is one which I have studied professionally, and been educated to know the importance of in years of practical labour and experience.

Dear Reader,—Will you allow Lovetruth's remarks to plead also for yours very sincerely, A. H. W.

THE LIME LIGHT.

As the applicability of the lime light to photographic purposes has excited considerable attention of late, we purpose, prior to entering into details of its photogenic power, to give, for the benefit of those who are unacquainted with its details, some idea of the necessary appliances for obtaining it.



The illustration shows a simple blowpipe and jet, when fixed in a vertical position upon a board, which also supports the standard upon which rests the ball of lime.

The blowpipe is held in its position by means of the nut A on the upper side of the board, and the shoulder B on the under side. The screwed tube upon which this nut works is filled with fine brass-wire gauze, punched round with a gun punch, and rammed into the tube like so many "wads." The jet fits upon the end of it with a socket and shoulder, and is rendered air-tight by a leather washer, the cap C, tightening them together.

The standard is of metal, and through the top of it works a screw with a milled head at the lower end, and a carrier for the lime ball, brazed about an inch and a half from the upper end. The ball of lime has a hole down its centre, through which the screw passes: in size it may equal an ordinary wine cork. The two stopcocks communicate with the respective gas bags, which must have upon them an equal and similar pressure of at least a hundred weight. Care must be taken that these weights are not removed from either bag whilst the gas is turned on, or the bag having the greater pressure upon it will by degrees force a portion of its contents into the bag having the lesser pressure, and thus the gases will mix; this must, for the sake of safety, be avoided.

To use the lime light allow a stream of lighted, hydrogen to play upon the lime for a few moments. The flame is first of a pale yellow, and afterwards a deep red, caused by the combustion of the metal calcium in the lime: the oxygen is now turned on, and regulated so as to produce the best result. If the combined gases are turned too suddenly upon the lime, before it has had time to be properly heated, it will crack or decrepitate.

The lime must be kept in a bottle when not required for use, as the moisture it would otherwise absorb from the atmosphere would speedily destroy it.

It will be found that if twice the pressure is placed upon the gas reservoirs, or if the aperture of the jet is twice the size, so that double the quantity of gas is consumed, the light emitted will be not *twice*, but nearly four times as powerful.

The relative quantities of the gases required to produce the best effect will be one part of oxygen to two parts of pure hydrogen; but if common (carburetted hydrogen) coal-gas is used instead of pure hydrogen, the consumption of both gases will be equal.

The oxygen is the most expensive of the two gases, as it costs, when made on a small scale by the amateur or experimentalist, about fourpence a cubic foot: pure hydrogen, twopence a foot; and coal-gas, about fourpence halfpenny for 100 cubic feet as obtained from the gas-works.

Notwithstanding the expense of oxygen, it has been proved that the lime light can be used so as to cost 25 per cent. less than coal-gas, and yet give ten times the light; this is owing to the small quantity of the combined gases required to render a certain amount of lime incandescent.

A method has recently been discovered of making oxygen at a merely nominal cost; but the price as above given is when chlorate of potash and black oxide of manganese are used.

In regulating the light, it is necessary to use dark spectacles to preserve the eye, which would otherwise be temporarily incapacitated either for focussing or manipulating in the dark-room.

The blowpipe is sometimes fixed in a horizontal position, and the jet is curved backwards in the direction of the stopcocks. The standard holding the lime will still retain its vertical position, but it must be placed so that the ball of lime shall be between the stopcocks and the aperture of the jet, from which it is distant about one eighth of an inch. This position is often adopted for the lantern for dissolvgin views.

Scientific Gossip.

There is perhaps no substance employed by the photographer which is more systematically adulterated than the chloride of gold used for toning purposes; the great intrinsic value of this article offering a strong inducement to dishonest traders to add to it some other chemical of comparatively little value, with the object of increasing its bulk and weight. If the advantage so derived be great to the adulterator, the evil is not less to his victim, and we think it right here to draw attention to the results of some analyses of commercial chloride of gold which have recently been made by Mr. R. Reynolds, the full details of which will be found on another page.

It will be seen that in one sample the amount of fraudulent sophistication was in all 31·7 per cent., or an excessive profit of £31 14s., or in other words a barefaced robbery of the above amount, on every £100 worth sold.

Mr. Reynolds considers that the deliquescent nature of the pure chloride of gold renders it a difficult matter to fill the bottles with accuracy as to weight, whilst the varying amounts of moisture which the maker may leave in the salt will always be a source of discrepancies in value. He suggests that the former difficulty may be overcome by sending out the solution instead of the solid choride. At the least, purchasers should require a guarantee of seven grains of pure gold in each bottle professing to contain 15 grains of of the chloride, whether the contents may be solid or in solution. A still better plan, in our opinion, would be to adopt the plan which we have before advocated in this journal, and replace the chloride of gold by the sodiochloride. This answers in all respects as well as the chloride, whilst it is easily obtained pure, and being non-deliquescent, there would be no reason why the purchaser should not have the exact number of grains he requires weighed out to him from the stock bottle, just as he does any other chemical. One difficulty, that of short weight, would thus be got rid of, whilst the remaining one, that of adulteration, would soon disappear if the maker knew that his chloride of gold and sodium, plus an unlimited excess of chloride of sodium, would, in all probability, be submitted to analysis, and the results, with the maker's name attached, published the next week in the PHOTOGRAPHIC NEWS.

Some experiments rather important to photographers have been recently completed by a Mr. King, on the amount of light which is absorbed by glass of different kinds. The results obtained are very interesting, more especially as it is a subject which directly affects those who are in the habit of working in glass rooms, and has not hitherto attracted the notice which it deserves. The following are the percentages of light which was found to be lost by the use of different kinds of glass :—Clear glass obstructed 10·57 per cent.; ground glass, 29·48 per cent.; smooth opal, 52·83 per cent., and ground opal 55·85 per cent. As the large amount of light lost by the use of a clear glass shade excited some surprise, a sheet of common window-glass was placed between the burner and the photometer screen, when it was found that 9·34 per cent. of the light was intercepted, thus confirming the result obtained by the employment of a shade of clear glass. These experiments show what care should be taken in the selection of the most colourless and clearest samples of glass for glazing the operating room; for even when perfectly clean, it will seen by the above that no inconsiderable portion of light will be obstructed by the glass, whilst if dirty, the atmospheric action must be enormously increased when it is seen that even clean ground glass will cut off nearly 30 per cent. of the actinic rays. It should be mentioned, in passing, that Verver has previously called attention to this subject. In 1858 he wrote, "It is not necessary to surround the wick (of platinum placed in the flame of 'water gas') with glass chimneys, as with ordinary coal gas; on the contrary, it is preferable not to employ them, because the chimneys, no matter how well polished, or how clean they may be, always absorb a considerable portion of the light which is produced. This loss is shown by the following experiment:—A burner with twelve jets without any chimney, afforded an illuminating power of 6·75 candles; but on surrounding the wick with a clean and perfectly polished chimney, the illuminating power amounted only to 5·25 candles; it had consequently diminished 1.50 candles, equal to 22 per cent." These experiments of Vevers are likewise important, now that artificial light is being employed for photographic purposes; they show the great importance of having the illuminating rays as free as possible from any obstruction of shades chimneys, lanterns, &c.

An enterprising American firm, the Waterbury Cotton Company, have been making a good thing out of the recent election of president. They are the proprietors of a patent by Mr. D. F. Maltby, for the manufacture of a small medal, composed of a ring or plate of solid metal, constituting a frame of a metallic character, surrounding a photographic portrait. The owners of the patent hit upon the idea of issuing photographic medals of the different presidential candidates, and the idea taking with their supporters, an enormous demand sprang up for these party emblems. At one time the firm were turning out upwards of 20,000 medals a day.

A patent has been recently taken out by Mr. W. P. Shaw, of Bunhill Row, for the application of the principle of the stereoscope to the instruments known as "Thaumatropes" and "Phenakistoscopes." These, as is well known, give to objects shown by them, an appearance of motion. By these improvements, the patentee causes the objects to appear also in solid relief, as when seen in the ordinary stereoscope. He takes from a suitable object a number of photographic pictures, the pictures being taken in pairs, having a stereoscopic relation the one to the other. Between the taking of each pair of pictures the object is caused to perform a portion of the movement which it is desired to represent, the first pair of pictures being taken at the commencing part of the movement, and each successive pair showing the same somewhat further progressed than the previous pair, until the last pair shows the object at a point just before it regains its first position. Having obtained these pictures, he views them by means of a stereoscope, and by suitable mechanism, causes the pairs of pictures to be changed rapidly, each pair being submitted to the eyes in succession for a moment of time. When thus seen, an appearance is obtained as of a solid body in motion. Mr. Shaw is late in the field. Besides the suggestion (and we believe realisation) of such a machine by Mr. Claudet many years ago, Sir John Herschel proposed the very same plan nearly a year ago in these pages, and since then it has formed the subject of one if not more patents before the present one was taken out.

Notes and Jottings.

No. III.

PRINTING IN SKIES FROM "STOCK NEGATIVES."—ON HANGING PICTURES DISTORTED FROM "COCKING" THE CAMERA.

IN discussing Mr. Fry's paper on "Instantaneous Photography," at the meeting of the South London Photographic Society, on the 20th ult., Mr. Hughes took exception to the plan of printing-in skies from stock negatives, remarking that "no sky will ever harmonise like the one that existed when the view was taken." We cannot entirely concur with Mr. Hughes on this point, although cordially coinciding with many of the ideas he at the same time so eloquently expressed.

It must be borne in mind that the clouds which almost entirely influence light and shade, are those situated between the sun and the landscape,—I am speaking of ordinary cases,—in which direction the photographer is not habitually fond of pointing his camera.

Let us suppose ourselves about to photograph a view on a "painter's day," with the sun on our right or left. It may possibly happen that at the moment the shadows of the flying clouds produce some wished-for effect on the landscape, we get nothing but blue sky for the camera, or, probably, clouds just where they are not required. We may *by chance* obtain the necessary balance of light and shade, but the contrary is far more likely.

An artist arranges the sky so as to harmonise with, and balance the other portions of his composition; and if, in photographing, he waits for the clouds to be as he would wish, in all likelihood the desired effect in the landscape is lost. Under these circumstances his only way is to take each at a different time and combine them.

In photographing a certain class of views, such as, for instance, when the camera is pointed directly towards the sun, it will be extremely difficult, and often impossible, to get any sky to harmonise as well as the one that existed at the time. But the best general effects are obtained with a side light, and not when the sun is directly behind or facing you. In all but the last-named instance, as before stated, the clouds got by the camera produce no effect on the landscape otherwise than by reflecting light, which, compared with direct light, is of little weight,—and thus the photographer, if he desires a composition according to rule, is necessitated to adopt the plan advocated by Mr. Fry.

We may possibly have read Mr. Hughes too literally, and he perhaps only deprecates the employment of such means by those who have not the requisite artistic knowledge. If so, he is undoubtedly right, for a well manipulated "rule of thumb" photograph in such a person's hands would chance to have the good qualities it happens to possess, spoilt. Nevertheless, that is no reason why others more experienced in the rules of art should not endeavour to produce a higher order of artistic pictures, by some method similar to that advocated.

Should you chance to possess a photograph having converging perpendiculars, produced by "cocking" the camera, viewing it in an inclined position, the upper part being nearer the eye, the distortions can be made to disappear.

It is customary in hanging a picture above the level of the eye to cause it to slant off from the wall more or less, to an extent depending on the height at which it is placed, and the distance from which it is to be viewed. The rule is, that a line drawn from the spectator's eye should fall perpendicularly on the plane of the picture. It will, therefore, readily be seen that by inclining your photograph beyond this, the distortion may be considerably lessened in appearance. MICHAEL HANNAFORD.

LUNAR PHOTOGRAPHY.

BY SAMUEL FRY.*

PHOTOGRAPHY, as generally understood, seems so inseparably connected with the light of day, that it appears at first glance anomalous to speak of taking pictures at night without artificial light; but one moment's consideration points to the true state of the case; though to us it be "dark as Erebus," to the lunarians, if such there be, inhabiting that portion of the moon's surface which is turned towards us, it may be broad sunshine, sunrise, or sunset, according to the moon's age and position. If, therefore, we choose a time for our operations in which we are favoured by the same atmospheric conditions required for producing good terrestrial pictures, we have many probabilities in our favour of obtaining good photographs of the moon. It has been matter of surprise with many that lunar negatives display a much larger variety of tone, and gradation of shading than the eye can detect on the surface with a telescope, but photographers will easily understand that this is of necessity the case, as whilst large tracts of the moon's surface north-west of Tycho, and also south of that centre, are of a silvery whiteness, other parts to the east and south-east of the lunar surface, present varying hues of yellow and green, each shade having its actinic value, and being accurately impressed on the photographic medium. And this variation in colour is a very happy circumstance for us, as, if the pure silvery tone of the upper portion extended over the entire disc, how flat and chalky would the pictures be.

The darker portions of the moon's surface are generally known as seas, but the appellation appears to be a gratuitous one, as beyond the supposition which some have entertained that the colours before alluded to were caused by sands and other deposits, constituting dry oceanic beds, there appears no other cause for thus denominating what are evidently now dry arid tracts.

My attention was first called to the photography of the moon at the commencement of 1857, by having placed at my disposal the very fine equatorial telescope of Charles Howell, Esq., at Brighton, which had then just been erected in a suitable observatory on the beach, about a mile from the town. I determined to commence operations at once, and with that object fitted up a little laboratory in another room of the observatory, adjoining the instrument room. I found a difficulty at starting arising from the circumstance of the extreme cold of the place, greatly reducing the photographic power of the chemicals, and it was thenceforth needful to keep the bath and developer in a dwelling-house for warmth. I then commenced experimenting for the purpose of discovering the exact actinic focus of the telescope, for as the object glass of 8½ inches diameter, and 11 feet focus was not corrected for the chemical rays, it was necessary at starting to discover the point of sharpest possible focus. I had made a mahogany board, 12 inches long and 4 wide, with a screw extending the entire length, and so arranged, that by turning a thumb screw at one end, an upright plate-holder at right angles with the board could be moved in either direction. I also made a graduated scale of degrees along the board divided into $\frac{1}{100}$ of an inch; the eye piece of the instrument being removed, this simple camera was by means of an adjusting collar fastened to the end of the telescope, by the thumb-screw at the end. I obtained a remarkably sharp image at the visual focus, about 3½ inches from the aperture of the telescope, and I began by taking a picture at this point, which, of course, from the non-correction was quite out of focus, but was preserved for comparison; I then began by removing the prepared plate $\frac{1}{10}$ of an inch back from the visual focus, and soon found my pictures showed evidence that I was approaching the true focus. I ultimately found that the average sharpest focus was at 0·75 inches beyond the visual, but I found constantly a slight, as it were, oscillation of focus within, and beyond this point, caused primarily, no doubt, by the varying distance of the moon from the earth, and also to a certain extent by the condition of our atmosphere. M. Claudet was one evening with me at the observatory, and stated on being informed of this circumstance, that he considered it a striking corroboration of a theory he had advanced at an earlier stage of photography. I always found it necessary on commencing operations to make one or more trial pictures, to discover the very sharpest possible focus, and on more than one occasion, when the moon was in a plane peculiarly suited for delineation, great loss of time arose from overclouding, and other unfavourable conditions of atmosphere. For this reason a reflecting telescope is greatly to be preferred to a refractor, as by a reflector the focus may be obtained as in an ordinary camera from the coincidence of the foci.

I now come to the mechanical arrangement necessary for driving the telescope to follow the moon's apparent path, For as even under the most advantageous circumstances an exposure of a few seconds is necessary to secure a good negative, it is indispensable to annul the rapid lunar motion by most accurate smooth running machinery. This was done by a powerful clockwork, regulated, as Mr. De la Rue describes his also to be, by a conical double beat pendulum, acting on the same principle as the governor of a steam engine. This was easily set to go at any given speed by a dial, and degrees marked thereon, and a few experiments enabled me to set it at any given time to exactly follow the moon; though at first it was rather difficult to discover whether want of sharpness arose from incorrectness of focal position, or want of adjustment of the clock-movement, the mistiness being much the same from each, but the latter fault gives also a rather oblong appearance to the image. With regard to the chemical part of my arrangements, I find it of primary importance to employ the very best chemicals, and the highest possible state of cleanliness; perfect freedom from floating particles in the bath, collodion, or developer, and all three so suited to one another, as to work uniformly together. I prefer positive collodion, as being more limpid, and thus pouring better, also from its usually containing both an iodide and bromide, in its composition; it does not deteriorate in sensitiveness to any extent, which enables one to keep it in a body in tall bottles and allow every particle to settle down to the bottom, and thus draw from the upper portion a quantity absolutely free from all inclination to produce spots, or comets. The bath I prefer of 40 grains to the oz., made of pure crystals; and if at

* Read at the meeting of The London Photographic Society, on Tuesday, Jan. 8, 1861.

all acid, I reduce it by saturation with the oxide of silver, and add, testing carefully meanwhile, drop by drop, a weak solution of nitric acid.

I believe this is the way to obtain a bath capable of producing the very highest results for any branch of photography. The developers I use are sometimes pyrogallic, 3 grains to the oz., and at other times iron of 10 grains, and 1 grain of acetate of soda. Under very favourable circumstances I use the former, as giving at one operation a vigorous well-defined negative, but where I have to contend with yellowness of the atmosphere and its concomitant photogenic drawbacks, I use the iron solution and intensify afterwards with pyrogallic and citric acid. In using iron it is absolutely necessary to hit upon exactly the right time of exposure, as a second too much or too little I find sufficient to mar the picture to a much greater extent than when pyrogallic is used. The extreme difficulty of obtaining good lunar negatives would scarcely be credited without actual experiment; the disturbing causes are so numerous, and apparently so trivial, and yet, so often fatal; a strong breeze in the upper regions of the atmosphere when almost calm below; night vapours and mistiness arising after a warm sunny-day; or, when all the preparations are made, and the photographer at his post, perhaps at midnight, or often much later, cloudiness may set in, and completely upset every chance of getting pictures. In so variable a climate as ours, the opportunities of obtaining really fine lunar negatives are like "angels' visits, few and far between."

(*To be continued.*)

Correspondence.

LONDON PHOTOGRAPHIC SOCIETY.

"The object of the Photographic Society is the promotion of the Art and Science of photography, by the interchange of thought and experience among photographers."—Vide *Journal of the Photographic Society, opening statement of Volume I.*

SIR,—I am a member of the above society, and feel a keen interest in its behalf. Yet I am not satisfied with its proceedings, and your journal being the organ of no society, I feel in addressing my remarks to you I am treading on neutral ground. I feel that our society does not get on in the same ratio as some others, and this arises, I think, from its very constitution. This may have answered in the commencement, but I do not think it suited to it now. Three years ago it was proposed to revise our laws, and two years since, at the annual meeting, the Lord Chief Baron said, "the laws, although adapted to an embryo state, were undoubtedly liable to objection, and we were promised that the Council would consider the matter and amend the laws;" and yet to this day they are not amended, and there is no probability they ever will be unless there be a pressure from without. Nay, what these laws are, very few know, for they have been two or three years out of print. This is not what it should be, and in part is owing, I think, to the cumbrous machinery of our government. Our affairs are managed by a president, three vice-presidents, a secretary, a treasurer, and nineteen members of council, one-third of whom retire annually, and as the new members are nominated by those remaining, for all practical purposes this council may be said to be self-elected.

"The object of the Photographic Society is the promotion of the art and science of photography, by the interchange of thought and experience among photographers;" these are the opening words of our journal, and one naturally expects that those who are placed on the council are the members best able able to further this object, Let us see who the council recommend next annual meeting to be elected:—The Earl of Caithness; Mr. Warren De La Rue, F.R.S.; Mr. Walter Hawkins, F.S.A.; Rev. J. B. Major: Mr. T. R. Williams. Now, these gentlemen may be the very best that could be selected "to promote the art and science by the interchange of thought and sentiment," during the next three years; but I should like to know what principle governs their selection.

The Earl of Caithness is, I doubt not, a highly intelligent nobleman, and if he has acquired a knowledge of our art, I shall be glad to hear of it; but I know of no reason whatever why he should be entrusted with the management of our society, and for that reason, with all due respect, I shall decline to vote for him.

Mr. Warren De La Rue is a highly distinguished man of science, and well known in connection with celestial photography; and our society will be honoured by having him for one of its councillors, more particularly if he will come amongst us, and give us the benefit of his photographic experience, and of which we can have no doubt, from the kindly and deeply-interesting communication he gave at the last meeting.

Mr. Walter Hawkins is, I believe, quite unknown to us, and why he should be recommended to me to "promote the art and science" I cannot tell; but I shall erase his name, and put in one that I have confidence in.

The Rev. J. B. Major was for a time our secretary, and although he acquitted himself in a desirable manner, I never heard that the society benefited by his management, or that he in any other way has earned the position of a member of council.

Mr. T. R. Williams: this getleman we do know, as being one of our cleverest portraitists. Gentlemen distinguished for chemical photography, landscape photography, and no photography at all, have had seats at the council; but this is the first time an avowed professional has been offered one. I congratulate the council on their tardy justice to the most universal branch of the art. Hitherto it has been considered that a gentlemen might derive any amount of pecuniary gain from the art, and yet keep a seat at the council; but that if he publicly adopted it as a profession, he would be disqualified. I am glad this invidious distinction has been removed, and that while the doors of the council chamber are open to an unknown Earl, they are also ready to admit a skilful portrait-taker.

But when this innovation was decided on, I cannot understand why this particular artist was selected. Perhaps I am hard to please, but I must return to my text, that the object of the society is "the promotion of the art and science by the interchange of thought and experience," and seeing this gentleman has never yet interchanged his thought and experience with us, nor even taken part in any of the desultory discussions, I cannot see why, highly skilful and meritorious though he be, he should be selected in preference to others who have contributed.

Professor Bell, I find, is to go up to the vice-presidency, and Mr. Fenton to descend to the council-board, and by this interesting change of seats the art and science of photography will doubtless be materially "promoted" during the ensuing year.

Now, seriously and earnestly, I ask, is this the way to manage what ought to be the best society in the kingdom? Many times last season we had most dreary meetings, and once or twice literally nothing provided. On the first night of this season, after a vacation of many months, only parts of a dry mathematical paper, without diagrams, were read, at the next meeting we were instructed how to protect our negatives with an antiquated and exploded varnish, and at the very last meeting neither president, vice-president, or one of the nineteen councillors were present even to take the chair.

Such a society as ours ought to be the best managed in the kingdom—should have a plethora of papers, and not a meeting should pass without some valuable or at least useful contribution being made. To read a paper before such a society ought to be held an honour, and only worthy matter be introduced. No society can be compared with ours for the advantages it possesses. It is the oldest, the largest, and the parent of all others. It is patronised by royalty, graced by nobility, and made illustrious by distinguished members. It established the first journal exclusively devoted to our art, and by its successive annual exhibitions gave that impetus to photography that has made it what it is. And shall a society like this die out, when small provincial and suburban ones are full of life? Nothing is wanting but skill and energy to make this society greater than ever it was. No other society has a paid officer, and his business it should be to put himself into communication with everybody and everything bearing on the art, so that information might stream in from all quarters.

Our society, with its clumsy machinery, is too much like the Lord Mayor's state coach—heavy, lumbering, and fit only to go at a slow pace; but these are not slow times. Photography is the type of the age, it won't wait. Go on we must, or we shall be run over by those behind, and it is for my fellow-members to bestir themselves to prevent our society being extinguished by the apathy of our executive, or the superior energy of rival societies.

Hoping that these remarks will rouse attention to the important subject I have broached, I subscribe myself,

Progress.

WHO DISCOVERED THE COLLODION PROCESS?

Sir,—I would, with your permission, call attention to a communication read at the last meeting of the French Photographic Society, regarding the place Scott Archer, and in fact England, should occupy regarding the introduction of collodion as a photographic material. I am the more disposed to do so, from observing that M. Lacan, who was present at the meeting, has not noticed the article at all in his letter to a contemporary, though in it he expresses his regret at the poverty of photographic news.*

The communication referred to was made at the meeting of the *Societé Française de Photographie*, held on the 23rd of November, and is reported in the society's organ for December. It is described as a "Historical Note on the Labours of Le Gray in the employment of Collodion;" but the real purpose of it is more distinctly set forth in the preamble, which states that in the following note M. Humbert de Molard purposes to demonstrate, by extracts from original publications, that M. Le Gray was the *first* to recommend the use of collodion in photography, and that he had anticipated the discovery of Mr. Archer.

Now, I think this a rather important matter, and would gladly, if my time permitted, give the Frenchman's edition of the early history of the collodion process *in extenso*, with the important omissions he has made filled up, and if no one is more competent to take the subject up, I may at a future time do so more at length. Meantime, I wish to call attention to the article, that British photographers may know what is the opinion of the Photographic Society of France; but more particularly to notice a very grave error M. Humbert de Molard has fallen into, in his so-called extracts from original publications. He says, 1851, 20th of November, "*Athenæum*, *first communication* of Mr. Scott Archer." I had always supposed that Mr. Scott Archer published his all-important discovery in the *Chemist* for March, 1851.† Without entering on the main question, whether Mr. Scott Archer was really the first to give a photographic process with collodion, this is a very grave blunder in a communication which aims at historical accuracy, read to a scientific society, and published in the society's Transactions, with the seal of their approbation.

The readers of the Photographic News are no doubt aware that Mr. J. E. Tunny of Edinburgh has some time ago announced that he began to work with collodion from the information obtained through the publication of Le Gray, said by M. Humbert de Molard to have been published in June, 1850. The satisfactory verification of these two facts is the whole question. Did Le Gray publish directions for taking pictures by collodion on glass in June, 1850, and did one or more persons, actually following out these instructions, take pictures? The exact date of Mr. Archer's publication is easily ascertained, as he published in a periodical publication whose date is known with certainty. Le Gray's presumed prior publication—which, observe, I do not for one moment either, in present circumstances, doubt or deny—is made in an appendix to a treatise on the art in general. The date of the publication of this appendix is not so easily or certainly ascertainable as that of a magazine appearing regularly.

I need not say I have no wish to set up one over another as the true inventor of this process, my aim is to ascertain with an approach to certainty what is the truth, and if my brief note call attention to the pretensions of our Gallic neighbours, it will serve the purpose I have in view. Honour to whom honour is due, is a maxim, and I am sure British photographers do not desire any exception in this or any other case. Le Gray is already honoured amongst us, as a most prolific photographic inventor, and one of the most successful operators in our fascinating art, and no one will grudge him a higher place if it is proved to be his due, and, if I am not mistaken, least of all would the talented artist we are accustomed to recognise as the true discoverer of the photographic capabilities of collodion have been disposed to do so, had he been still with us.—Yours, &c.,

Glasgow, Jan. 2, 1861. John Cramb.

* The subject is noticed by our Paris Correspondent in last week's Photographic News.—Ed.

† Mr. Scott Archer's communication is dated 18th of February, 1851, and appeared in the March number of the *Chemist.*

FOREIGN SCIENCE.

[from our special correspondent.]

Paris, 9th January, 1861.

Photographers have reaped a rich harvest in Paris during this festive season, for among the *élite* the choicest gifts and the most acceptable presents on the *Jour d'An* have been photographic gems. Not such things as you see in every shop window, and can buy for five francs, not at all; but real gems that have never before been photographed, such as every amateur, connoisseur, and dilettante would delight to add to his "Harvey" portfolio. Now it is a copy of a Carlo Dolce or a Gerard Dow, or an *Immaculate Conception* of Murillo; a chiselling of Benvenuto Cellini's or of Pradier's; or it is a *fac-simile* of a page of a rare missal or illuminated manuscript—anything, in fact, particularly *recherché* or unique. Favoured fair ones show their albums exultingly, half-filled as they are with such photographic treasures as I have specified. As these are for the most part the works of cultivated amateurs, of course they are the more highly prized, inasmuch as they have not the odour of the *boutique* about them. The array of *cartes des visite* which some fashionables have received from their guests is truly marvellous, alike for the personal interest of the portraits, as well as for the extent of the collection; and it is in the production of this class of photographs that the industry of professional photographers has been exercised so extensively.

In a recent letter I described M. Fargier's process of carbon printing. As it was not quite successful in the hands of certain amateurs who tried it, the inventor has kindly furnished minute details, which I think will tend to remove any difficulty that may be encountered in repeating his experiments.

M. Fargier first points out a radical defect in the processes employed previously to his own, by M. Poitevin and others, viz., the carbon mixed with gelatine, &c., is not a solution, but a powder held in *suspension*, which has never sufficient tenuity to penetrate the pores or even into the substance of the paper, and consequently it remains on the surface of the paper, and forms with the gum a coating of a certain thickness. Now, however thin this coating may be, the light does not act at once throughout its entire substance. The light acts in proportion to its intensity, this intensity is greatest at the surface of the coating, and gradually diminishes as it penetrates the thickness of the coating; therefore the coagulation of the coating must commence *at the surface*, and is continued further and further into the interior in proportion as the exposure to light is prolonged. From this fact it follows that the picture formed on the gum spread upon paper, as above mentioned, is not directly sustained by the paper, but rather by the gum which the light has not penetrated, and which, consequently, remains soluble. It may readily be imagined that the picture will disappear when it is washed in water, at least, the half-tones will, and they are the most essential to a good picture; for the deep blacks, which the light has passed through and through, rest directly in contact with the paper, and remain.

But if, after having prepared the sheet of paper as above directed, the negative is placed, not on the prepared gelatine side, but on the back, so that the light which passes through the negative traverses the paper before it reaches the gum, coagulation will then begin at the surface of the gelatine *in contact* with the paper, and the *whole* picture will remain on the paper after washing. It was in this manner M. Fargier obtained his first proofs, but it has some inconveniences; the time of exposure is necessarily longer, the proofs are reversed in position, and they have a granulated appearance, arising from the light passing *through* the paper, and this is not uniformly translucent.

Since then, M. Fargier has substituted collodion for the paper, with complete success.

In some experiments recently conducted with a view of ascertaining how much light is intercepted by different kinds of glass, it was found that "English plate," one-third of an inch in thickness, intercepted 6·15 per cent, of light; "crystal plate," one-eighth of an inch thick, 8·61 per cent.; "English crown," of the same thickness, 13·08 per cent. This great loss of light may be partly accounted for by the conversion of a portion of the light into heat—an effect perfectly in harmony with the theory of transverse vibrations, as applied to explain the phenomena of polarization of heat. On this theory, heat and light are different effects produced by one and the same cause, and they differ physically only in the amplitude and rapidity of their vibrations. The screen through which the vibrations of light are propagated serves to diminish first the rapidity of the vibrations requisite to produce the most refrangible rays, and in proportion as the transparency of the screen is diminished by any cause, inherent or superficial, this arrestation becomes more and more complete. As the more rapid ethereal vibrations have probably the least amplitude, we infer from analogy in sound-waves, that as waves of least intensity have the greatest amplitude, so with the luminiferous ether the extreme red has but little brilliancy. Hence the loss of light from polished screens is small compared with that observed in screens of opaline or roughened glass. It would be instructive to examine the spectrum obtained from a pencil of rays under each of the cases given in the above experiments, by means of a sulphide of carbon prism.

In connection with this subject it may not be inappropriate to refer to the experiment of Dr. Draper, on the spectrum formed by means of a platinum wire, heated gradually from dull redness to perfect whiteness by a voltaic current. He observed the red part of the spectrum to appear first, and as the heat and luminousness of the wire increased the other colours of the spectrum appeared after the violet. This result perfectly harmonises with the views expressed above.

Beyond this, there is little photographic progress to record. The weather is too cold for operating; so we are busying ourselves in putting our houses in order, and preparing for next season's campaign.

PHOTOGRAPHY IN GERMANY.

Elberfeld, December 28th, 1860.

Having lately received a lot of Dr. Hill Norris's dry plates, I proceeded to make some experiments, for rapid results, with them. I exposed a quarter plate, with a German 1½-inch portrait-lens, 15 seconds in the glass room, moistened the plate with distilled water, poured some 5 per cent. nitrate of silver solution upon it, and developed by protosulphate of iron, (5 per cent. of this salt, and 7 per cent. of acetic acid). The picture came out very clean and fine, but too transparent. In order to strengthen it, I added to the iron solution a few drops of silver solution, poured this on the picture, and so I got a remarkably fine negative. Having fixed with hypo, I let the plate dry before a fire; but in drying, the upper part of the collodion film contracted, and several transparent marks appeared and spoiled the picture. Of course, this resulted from a too dense precipitate upon the film. I tried therefore, only to make the image darker, without employing much silver. Having exposed a second plate, with a single landscape-lens, and small stop, (it was a cloudy day, but the ground and houses were coated with snow,) 10 seconds, I developed as before by sulphate of iron, then washed, and strenthened as usual, by pyrogallic (and citric) acid, and nitrate of silver. An excellent negative was the result, dense enough in the lights, and very transparent, and detailed in the shadows. The colour was of a greenish black, similar to the colour of a negative upon collodionized paper, which copied very rapidly. The collodion seems to contain much water, too much at least for my taste. I think the plates may be recommended as giving safe results.

Here I may note that some years ago I got equal results upon dry collodion plates, prepared by M. Quinet, of Paris. I do not remember to have met with one failure. The collodion film was more solid than Dr. Norris's, and it was impossible to remove it by washing. The plates were developed by two solutions delivered by the inventor, and consisting, I believe, the one of a mixture of pyrogallic and gallic acids, and the other of silver solution; but I got the same results in using pyrogallic acid. The last of these plates was exposed fourteen months after the preparation, it was as sensitive and good as the first ones. The collodion sold by M. Quinet for preparing these plates was very thin, contained a large excess of ether, and remained of a light yellow colour. With the collodion I never got as fine results as with the ready prepared plates. I think the collodion contained resin.

Herr Schrank, of Vienna, states in a correspondence to the *Photographisches Archiv*, that he has found a means to produce thin and transparent negatives, which copy in half the usual time, but are strong enough to give good contrasts. He describes his process in the following terms:—

Prepare a bath of acetate of silver, concentrated, because this salt is not very soluble in distilled water. Having excited a collodionized plate in a neutral nitrate of silver bath, drain off the solution, and put the plate for some seconds into the second bath of acetate of silver. (This bath is to be kept in the dark, because in the light it readily decomposes, from its organic character.) Expose and develope as usual by the pyrogallic. The negative comes out in an orange-yellow colour, which turns into an agreeable bluish violet, when nitrate of silver is added to the developer. It is important to remark that this proceeding *allows the time of exposure to be shortened one-half.*

At Vienna, a "Society for the Advancement and Development of Photography" has been formed, under the presidency of M. Schrötter, a well-known chemist, and Pezval, the calculator of the portrait and orthoscopic lenses.

Dr. Schnauss, entering into the subject of several remarks made by Mr. Sutton, about the formation of acetate and oxalate of silver in the silver bath, believes that these combinations will not exist in the bath if they are not added directly to it. He reminds the reader, that during the transformation of the ethyl order—to which alcohol ($C_4H_5O + HO$) and ether (CC_4H_5O) belong—to the acetyl order (C_4H_3) *before* the formation of acetic acid ($C_4H_3O_3 + HO$) there is yet a grade between, viz., the aldehyde ($C_7H_3O + HO$). This perhaps could be present in the bath. He believes that several salts of ether, acetic ether, and perhaps also nitric ether, can be formed; and he sometimes found the first one in old baths. The acetic ether dissolves pyroxyline, and in that manner small portions of this may pass into the bath. Acetate of silver can only be formed when acetic acid and a free alkaline carbonate be added to the bath, or an acetate. Acetic acid alone cannot separate the strong nitric acid from the oxide of silver. By the use of an alkaline collodion, acetate of silver perhaps could be formed.

Now, coming to the formation of oxalate of silver, we must ask, whence the oxalic acid may come? It is formed by the influence of nitric acid upon the carbo-hydrates (?) (kohlenhydrate), for example, the sugar and the cellulose. It is evident that it may be formed during the preparation of pyroxyline, and thus go over to the collodion, being soluble in alcohol. It should be purposely tried, in what manner oxalic acid acts when introduced into the collodion. Probably in the same manner as acetic acid.

Well, suppose the collodion to contain oxalic acid, may it be in a free or bound state? Let us see how it reacts upon nitrate of silver, in order that we can estimate of its effect upon the bath.

A solution of oxalic acid, poured into a 40-grain solution of nitrate of silver, produces a thick white precipitate, which is insoluble in water, but soluble in strong acids. By the precipitation some nitric acid gets free, and a small portion of the oxalate of silver remains in solution, so that the filtered part is troubled [rendered turbid] by chloride of sodium. But in adding an oxalate (oxalate of ammonia) to the silver solution by double decomposition, nitrate of ammonia and oxalate of silver are formed. By this way the silver can be completely precipitated out of a neutral solution, so that chloride of sodium does not longer render the filtered part turbid. Only when much nitric acid is present in the bath—and this never *should* be—a trace of oxalate of silver would be dissolved. Of course, it could be formed in the collodion film itself, beneath the iodide of silver, when the collodion contains oxalic acid or an oxalate.

Surely, there is yet to dig out a hidden treasure concerning the salts of silver in photography.

The *Photographischer Almanach für das Jahr* 1861 is a small luxurious printed book, issued at Berlin. Besides a record of the progress of photography, it contains several humorous stories and poems about photographic occurrences. The title-page is decorated by a beautiful photograph.

The addition of an acetate to the negative developer is certainly an old thing, as "An Amateur" (PHOTOGRAPHIC NEWS, p. 382) remarks, and was first recommended, I think, by M. Gaudin. It would be a rather difficult task to think only about *new* things, when we remember the old saying, *Nil novi sub sol.* The stereoscope may have been known some two hundred years ago. The industrious American made, a few years ago, an invention to photograph without a lens, using a dark box with a hole, the same instrument first used by Porto, the inventor of the camera-obscura. Mr. Griffith has now detected the iodo-nitrate of silver, though Dr. Schnauss made known the formula of this combination in *Dingler's Polytechnisches Journal* of 1855, likewise proposing to use this double salt directly in the collodion.

> Die Welt wird alt und wieder jung,
> Doch der Mensch hofft immer verbesserung!
>
> (The world gets old and again young,
> But men hope always for improvement!)

A similar case occurs with the employment of electric light to photographic purposes. The first experiments in this direction were made by Schroeder and Schaufuss, of Leipsic, 1858.* A Bunsen-battery of forty-one elements was used, and a negative got after a photographic picture in two minutes. In ten minutes a feeble copy in the pressure frame was obtained.

I may remark here, that in the cloudy, snowy days before Christmas, I have regularly made use of the electrical light to accomplish a very considerable number of copies. The cost I do not find too great. In short, I shall publish something more about this very interesting adaptation.

P. E. LIESSEGANG.

* We believe collodion pictures by the electric light were produced in Dublin at a date anterior to this.—ED.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF LONDON.

THE usual monthly meeting was held on the evening of the 8th inst., J. G. CRACE, Esq., in the chair.

The minutes of the previous meeting having been read and confirmed, the Chairman announced that the council proposed Mr. Vernon Heath and M. Joubert as auditors of the accounts for the coming annual.

Messrs. A. Claudet, Thomas Gillis, and Captain Verschoyle were elected as members of the society in the course of the evening.

A letter was read from Mr. Leighton, referring to an engraving, the designs of which had been photographed on wood from a negative of Flaxman's *basso-relievo*, and was published in the recently issued "Lyra Germanica." The letter referred to the difficulties which had been found in getting a photographic image on wood suitable for the engraver, and described the conditions required, but made no allusion to the method by which the engravings in question had been effected.

A very fine specimen of Mr. Osborne's photo-lithographic process was shown, consisting of a map of Cork. It had been forwarded from Melbourne to Mr. Hardwich by Mr. Osborne.

A plate-warmer, consisting of two flat boxes of tin, hinged together, which were to be filled with hot water, was exhibited by Mr. GUTCH.

Mr. DALLMEYER exhibited a stereoscopic camera with a simple instantaneous shutter, a description of which will appear in our next.

Mr. WARREN DE LA RUE, referring to the interest and importance of photographing on the wood block, said it was desirable that in regard to such a discovery exact dates should be fixed, in order that merit might be properly awarded. He remembered that some time in September a photographic transfer on to wood of a design, very similar to the one before him, was shown to him by his esteemed friend M. Joubert.*

M. JOUBERT said Mr. Leighton had called upon him in August last and asked him if impressions by his phototype process could be printed on wood. He told him he thought it could, and Mr. Leighton sent him the negative of the design now exhibited, and the design on the block now before them was one of those he had printed.

Mr. BOHN said he was not aware before that M. Joubert had printed the designs. A complete history of the matter would shortly be issued in "Jackson's History of Wood Engraving."

After some further conversation on the subject, in which the late Mr. Archer's attempts to meet the case by transferring collodion films to wood was referred to,

M. JOUBERT said that two years ago he had printed some photographs on wood, which he had still by him. The method used was the permanent printing process, which he had termed the phototype. He might here take occasion to say, regarding that process, that it was not yet published, chiefly because it was not yet in a sufficiently perfect state to be accomplished satisfactorily by ordinary workmen, but required skill and delicacy in manipulation. When he had brought it to such a state of perfection as to be quite certain in the hands of common workmen, he would make the process known. (This announcement was received with much applause.)

Mr. MALONE thought it important in discussing subjects of this kind that proper recognition should be made of all applicable methods which had been proposed. Mr. Crookes was not present himself, and he thought it only right to make mention of the method he had suggested of meeting the necessary conditions of photographing on wood, for the engraver, by using oxalate of silver. He was very glad to hear the frank explanation from M. Joubert regarding his process of phototype, and he hoped they might look forward for it soon. Regarding photographs on wood of transfers in printing ink, nothing, he thought, could be better for the purpose than Fizeau's photo-

* We can confirm Mr. De la Rue's statement, M. Joubert having shown to us at his studio, the designs in question, in September,

graphic etchings on Daguerrean plates. They were exquisitely delicate and full of detail, and capable of giving a sufficient number of impressions for all transfer purposes. He now took the liberty of suggesting impressions from these etchings for the purpose of transferring to the wood block.

The Secretary then read a letter on the subject of "Varnishes," in which the writer expressed his approval of white-lac varnishes, and his dislike of copal, which always cracked.

A letter from Sir C. B. Phipps was also read, stating that as Her Majesty was in the country neither she nor the Prince would be able to take their usual view of the exhibition, but would do so sometime before it closed.

Mr. Vernon Heath said it had been arranged at the last meeting that he should have an opportunity of making a few remarks regarding Mr. Dallmeyer's triplet lens. He found in the journal of the 15th of November, a letter referring to certain prints produced by Mr. Dallmeyer's lens, and in the same number was an advertisement making certain assertions regarding the lens. He was desirous of some information which he thought would be important to all. He wished to know what was meant by the statement that it was "quicker acting" than the orthographic lens or the ordinary single combination. Was it intended that the triplet lens, size of picture and of combination being equal, would produce a picture in a shorter time than the single lens? He must confess his experiments had produced a different result. He wished—

The Chairman interposed that he had understood that Mr. Heath had some explanation to make which would not occupy two or three minutes. They had an important paper to read and discuss, and if they entered into other enquiries, which must necessarily provoke discussion, there would not be time to do the subject of the paper justice.

Mr. Heath was in the hands of the meeting. It was their duty to prevent misapprehension, and he thought it a fair subject for present discussion.

Mr. Dallmeyer said, in regard to the statement of Mr. Heath—

Mr. Heath:—It is not a statement, for it is not yet made.

Mr. Bohn said such a subject should not be brought forward without proper notice.

Mr. Heath would like the sense of the meeting as to whether he should proceed.

The Chairman suggested that any further explanation should be deferred to the next meeting.

Mr. Malone thought they would be in the same position then. He thought no promise of an opportunity of bringing forward such a subject ought ever to have been given to Mr. Heath. If they were single out every ambiguity in letters or advertisements there would be no end of such discussions. He thought if they gave opportunity for discussion of this kind between gentlemen it would do them no credit as a society.

Mr. Heath again rose; but the Chairman called on

Mr. Fry, who proceeded to read his paper on "Lunar Photography." (See page 17.) After which

Mr. Warren De La Rue said he had listened with much interest to Mr. Fry's paper, and was glad that he was pursuing with assiduity his labours in that direction. There could not be too many labourers in that direction. There could not be too many labourers in such a field. If they had a dozen observatories, all attended by as skilful photographers, the result would be beneficial to astronomical science. In regard to the method pursued, it was all a question for experience to decide which gave best results. In his own hands, he had found best results from using fused nitrate of silver for his bath. He thought it was most manageable and least liable to change. He had tried the plan of neutralizing, or rendering alkaline with oxide of silver, and adding sufficient dilute nitric acid to bring the bath into proper condition, but he had never got a bath to work so rapidly, or to give such constant results as with fused nitrate of silver. The bath so prepared would give one or two foggy pictures, and then all would go on right. In the next place, as to development, he had generally found the best results from the use of the aceto-pyrogallic solution. He had used citric acid with the pyrogallic: it gave strong, vigorous, pictures; but there was a lack of that delicate transparency so essential for the correct rendering of celestial photography. He also found it wise to over-expose a little, so that the whole picture, with all its detail, developed directly, so that he could cease to develope at any point, without pushing some parts too far in order to bring out details in others. The collodion he had used was the ordinary negative collodion of Hardwich and Thomas, and he preferred the cadmium iodizer, as preserving its properties for a long time: it was, as Mr. Fry had well stated, of the utmost importance to have everything always in good order and ready for operations, otherwise, a fine night might be lost from the chemicals not being in order. All collodions iodized with potassium he had discarded, from their perpetual change and the uncertainty it introduced. Then as regarded the telescope, Mr. Fry had been working under some disadvantages; he had been using an achromatic telescope, but not one corrected for the actinic rays. There would be therefore some slight absence of sharpness, not due to any fault of manipulation, but solely to the instrument, as besides the defining rays, there were others not quite brought to a focus, which would cause a little confusion and want of sharpness. The instrument should be one corrected especially for the purpose. As regarded the driving clock he was constantly at work with one, but the best machinery would fail at some time; the beautiful motion of the earth was difficult to overcome, and the clock was constantly requiring some alteration. If it were set right to-night it would require some alteration to-morrow. The stress which Mr. Fry had laid upon the necessity for extreme cleanliness was of the utmost importance, as the smallest speck of dust would often derange results. He would now show some specimens, but he would ask photographers to remember that they were magnified eighty times, and they could scarcely expect the same sharpness as would be seen in ordinary photographs. The photograph of a part of the moon's surface which he showed had been magnified four hundred times. The mode in which it was produced was by putting the original under a microscope, and drawing in the parts by the aid of the camera obscura, and then producing from that a photographic copy. (Some very fine photographs were then handed round for inspection.) Then as to the production of stereoscopic pictures of the moon, if two pictures were taken differing only in libration of longitude, a satisfactory stereoscopic effect would be produced, but if they differed in libration both longitude and latitude they would only we stereoscopic under certain conditions. (Mr. De la Rue then illustrated by diagrams on the blackboard the effects of libration, and the condititions necessary, full details of which will be found in his pamphlet on celestial photography.) He concluded by stating that at some future time, he hoped to be able to give them some of his experiences in solar photography; but as he took part in the great expedition to Spain in connection with the solar eclipse, he could not do so until the results had been published altogether by the Astronomer Royal.

Mr. Shadbolt, referring to the method practised by Mr. Fry of producing first an enlarged transparent positive, and from that an enlarged negative, asked if he had ever tried the plan of taking a reduced transparent positive first, and from that an enlarged negative. He thought that greater sharpness would result.

Neither Mr. Fry nor Mr. De la Rue had tried that method.

Mr. Fry said if no other advantage had arisen from his paper, it had elicited the interesting remarks of Mr. De la Rue, with which he had entirely concurred. Regarding Mr. Shadbolt's question, he had thought that he had tried every method of getting a satisfactory enlargement, but he certainly had not tried this method of reducing first, and although doubtless the suggestion, coming from Mr. Shadbolt had weight, he did not see how superior sharpness would be the result.

Mr. De la Rue wished to add a remark touching the varying focus to which Mr. Fry had referred, he thought it most probable that this might be due to the varying length of the tube under different temperatures, as he did not think it would make any difference in this respect whether the moon was in perigee or apogee.

Mr. Hardwich had recently had an opportunity of visiting the observatory of Professor Challis, and photographing some of the spots on the sun. He knew he would have to contend with over-action of light, and took a bromo-iodized collodion as most likely to meet the case, and prepared his bath with forty grains to the ounce, as Mr. Fry did. He took also a very weak developer, consisting of about one grain of pyrogallic acid to the ounce of water. He had succeeded better than he hoped, and now handed round one of the prints for inspection. He noticed there was a strong halo surrounding the bright parts, similar to that seen round a meadow in taking an interior; this was the case with even the slightest exposure. This halation had been attributed to defects in the lens; but he thought that was not a satisfactory explanation, as it was more common with some kinds of collodion than others, and was rarely seen when a film of well-coagulated albumen was present. He would conclude by remarking, in reference to fused nitrate of silver, that he had been compelled to abandon its use, because he found it would not bear fusing, from the organic contamination in many of the commercial samples.

Mr. Sebastian Davis, referring to the different developers recommended by Mr. Fry and Mr. De la Rue, said that from some recent experiments he found a combination developer might be made possessing the advantage of the two. It consisted in mixing about ten grains of photosulphate of iron and one grain of pyrogallic acid in an ounce of water to which about one minim of sulphuric acid had been added. This prevented either discolouring or precipitation, and the detail of iron with the density of pyrogallic acid was obtained.

Mr. Malone, referring to the phenomena of halation, of which Mr. Hardwich had spoken, said it used to be frequently observed in daguerreotype practice. He suggested that it might be due to the action of the outstanding, uncorrected rays which were not brought to a focus. The subject was worthy of investigation.

Mr. De la Rue said he had found some difficulty in procuring nitrate of silver free from contamination with organic matter. The mode in which it is weighed and packed in paper he thought would readily account for the contamination. He found it the best plan to go to the refiners to procure it uncrystallized, taking care to prevent its contact with paper, &c., and then fuse it a little at a time.

The Chairman then announced that the photographic exhibition would be opened on Saturday to members and their friends, and on the following week to the public.

After the usual votes of thanks the proceedings terminated.

FRAUDULENT CHLORIDE OF GOLD.

BY R. REYNOLDS, F.C.S.

The consumption of chloride of gold in photographic printing is very considerable. As many chemists deal in the article, it is proper that they should be put upon their guard against frauds which have deceived several parties. I therefore give the results of the analyses of chloride of gold from three distinct manufacturers, which I have recently made, and although reserving the names of the guilty parties, shall probably take some future opportunity of examining their products.

All the samples referred to below were bought as chloride of gold, no mention of "non-deliquescent" being made by either buyer or seller.

The following are the results of the examination:—

"A. B."

Three "fifteen-grain" bottles taken at random, without removing wrappers. Contents were as follows:—

No. 1	11·7 grains
2	11·9 "
3	12·0 "
Average ...	11·87 "

One "sixty-grain" bottle taken as above, contents ... . 54· "

No. 1 was submitted to analysis:—

Gold, 4·4 grains = Terchloride of gold	6·75 grains
Chloride of sodium	3·80 "
Moisture and free acid	1·15 "
	11·70 "

As some makers of fraudulent chloride of gold reserve as a loop-hole the fact that the double chloride of gold and sodium is sold under the term of "non-deliquescent," and have the audacity to assert that no other is in the market, I give the composition which this should have had, even had it been the true double salt, although the preliminary notice shows that it was not sold as that. Terchloride of gold, 6·75 grains, would have combined with chloride of sodium 1·30 grains. Consequently there is an excess of chloride of sodium of 2·50 grains, simply diluting the mixture.

"C. D."

One "fifteen-grain" bottle taken as above, contents ... ... 15· grains

Analysis.

Gold, 7·25 grains = Terchloride of gold	11·12 "
Chloride of sodium	not a trace
Moisture and free acid	3·88
	15·

"E. F."

This was a solution labelled thus: "Neutral Solution of Chloride of Gold," guaranteed to contain 7 grains of pure gold, equal to 15 grains of crystallized "'non-deliquescent' chloride of gold."

Analysis.

Gold, 6·6 grains = Terchloride of gold	10·12 grains
Or = Chloride of gold and sodium...	13·26 "

The solution did not contain any chloride of sodium.

Practical Results.—Assuming "C. D." to be sold at a fair market price, the excess of profit over this to the maker of "A. B." is as follows, and of course, the loss to the consumer is the same.

On short weight	21· per cent.
(being average of three bottles)	
On lower quality	10·7 "
	31·7 per cent.

As, however, "A. B." was sold at 8·3 per cent. lower price, the sum will stand thus: 31·7 less 8·3 = 23·4 per cent. excess profit, or £23. 8s. on every £100 worth sold.

The samples "C. D." and "E. F," although not theoretically pure chloride of gold, may be considered to be commercially honest articles. The deliquescent nature of the pure chloride renders it a difficult operation to fill the bottles with accuracy as to weight, and the varying amounts of moisture which the maker may leave in the salt will always be a source of discrepancies in value.

The former difficulty may be overcome by sending out the solution instead of the solid chloride. I know of no reason why such solution should not be valued by its theoretical equivalent of gold, excepting that the practice of the trade has been going in another direction, and the change would involve an apparent, though not a real, advance of price to the consumer.

At the least, purchasers should require a guarantee of seven grains of pure gold in each bottle corresponding to the gramme, whether the contents may be solid or in solution.—*Pharmaceutical Journal*, Jan.

Miscellaneous.

Keeping Sensitized Paper.—A correspondent sends us the following:—Dry the paper thoroughly by heating it at a distance from the fire; get an ordinary pressure-frame, and some sheets of yellow tissue paper of the same size as the pressure-frame, when the paper is quite dry, lay it in the pressure-frame and put between each sheet of sensitive paper a sheet of the yellow tissue paper, which is better dried also before the fire, when you have sufficient paper prepared screw them tightly down in the frame, and put it in a dark and dry place. I have kept paper prepared by this method three weeks, which is a great advantage, as the weather has been so bad of late.

Shutter for Instantaneous Exposures.—Mr. J. C. Leake Jun., introduced at a recent meeting of the South London Society, a very ingenious and easily applied shutter for instantaneous exposures. It consists, primarily, of a slip of mahogany running freely in two grooved pieces of the same material, and placed directly behind the lenses, inside the camera. This slide is pierced with two holes exactly corresponding with the apertures of the lenses, but so placed, that when the shutter is quite up, to left or right, light is totally excluded from the camera. A brass hook is screwed into this and allowed to run through a slot in the front of the camera; a second hook being placed in the left hand corner, an elastic band is stretched over them both. The shutter now being drawn to the right, the elastic band is brought into a state of tension, in which it is retained by a brass lever. This, being pressed by the finger releases the shutter, the apertures in which pass those of the lenses, thus achieving the exposure. Mr. Meagher is, we believe, about to adapt this arrangement to some of his stereoscopic cameras.

Photographic Notes and Queries.

Amateurs and Professionals.

Sir,—I really don't like to occupy your valuable space on trivial matters; but I think the letter signed "An Amateur and Professional" ought to be replied to. I believe there are as many amateurs devoid of taste as professionals. I think any artistic photographer (say at some watering-place, where his sitters are both the highest and the lowest) will agree with me, that there are quite as many of the upper class who cannot appreciate a good photograph as of the lower. With regard to professionals taking the views in the winter, if they do, and they are well done, they have as much merit as if done in the summer; but I believe a professional with a love for the art will often sacrifice his more precious time in the summer to indulge his taste for landscaping. I have said his more precious time; why is it more precious? why should it not be as profitable for a professional photographer to take views as well as portraits? Is it because so many amateurs make it impossible? I know several amateurs who with double (by their salary) the takings of many professional photographers, take all their views for sale. They must think it sordid; for they seldom like their names mentioned: but, on the other hand, amateurs, with so much time at their disposal, take many beautiful views. If their object in publishing is to let the public have the benefit of them, I would suggest that all amateurs so inclined should publish their productions for the benefit of some institution, a hospital for instance; or let them be sold to form a fund for the purchasing of some good carbon or other process, or to award prizes for the best photographs; the ranks would soon be thinned of all tinkers, and tailors, or others, who had no talent for the calling. My advice to an Amateur and Professional is this; if he is an amateur, let him keep his productions to himself, or only amongst his nearest friends, and he will soon find professionals taking the same views, and equalling, if not excelling, his own: if he is a professional, and has realized such great profits by portraiture as to enable him to take a trip to London, by all means let him go. Before concluding, I hope all amateurs will think before they put their productions in the market, that they are on the point of injuring men who devote all their time (and their time is their money, as they depend on the art for a living) to photography, and are but badly paid after all. Apologizing for writing more than I intended, I am, sir, yours respectfully,

Fairplay.

[We give insertion to "Fairplay's" letter as a reply to "An Amateur;" but here the subject must drop, as it is not one for discussion in our columns. We can see no possible reason why amateurs should not make their practice of the art self-supporting, if not remunerative.—Ed.]

Talk in the Studio.

Photography on Wood. The wood engraving from a photograph on the block, to which we referred last week as illustrating the *Lyra Germanica*, was photographed by M. Joubert, by his phototype process.

South London Photographic Society.—At the meeting of this society which takes place on the 17th, T. Burr. Esq., F.R.A.S. &c., will give an interesting resumé of the aid which photography has afforded to astronomical and meteorological science.

The Phototype Permanent Printing Process.—M. Joubert announces his intention of making public the details of this process as soon as he has brought it to a sufficient state of perfection to be worked successfully by an ordinary workman. At present it requires considerable delicacy and manipulating skill to produce the best results.

Photographic Exhibition.—The exhibition of the Photographic Society opens in Pall Mall on Saturday to members of the Society, and on Monday to the public.

Architectural Photographic Exhibition,—The exhibition of the Architectural Photographic Association opens at the rooms in Conduit Street, on Tuesday, the 15th instant.

PHOTOGRAPHIC MEETINGS IN JANUARY.

South London	Thursday, 17th.
North London	Wednesday, 30th.
Blackheath	Monday, 21st.
Birmingham	Tuesday, 29th.

To Correspondents.

S. L. G—For lenses, No. 4 on your list. For cameras, No. 3. The plan you are adopting is an excellent one, and will well reward the trouble. If you send us your address we will communicate more fully in a letter.

J. R. A.—The law forbids *defacing* the coin of the realm; but that refers to what is intended for further circulation; we are not aware that there is any prohibition against using it for any purpose you like. As to the charge of "sweating" the silver, there is no ground for it; you need have no fear on that subject. The albumen process used by our correspondent Mr. Richards is the same as that described by our correspondent Mr. Archer, page 56, vol. 4 of the Photographic News, with a slight modification given at page 372, vol. 4. The same volume contains much information on the subject, as you may see by consulting the index.

B.—We are glad you have got over your difficulty. You will find it wise always to keep up the strength of the bath sufficiently. Your picture is a good and interesting one. Its only defect is the white sky. If that had not been stopped out the picture would have been all that could be desired.

A Young Beginner in Photography.—The only dictionaries of photography in existence are that published in our columns, and Mr. Sutton's dictionary, price 7s. 6d, published by Sampson Low.

Samson.—A negative collodion and neutral bath are best for the purpose. A low temperature is inimical to density. An argand oil lamp in your dark room will probably be sufficient to prevent your solutions from freezing; but it depends on the size of the room, &c. what effect it will have on the temperature generally. See an article on visiting card portraits in our present number.

James Tulley.—Any known method of printing by artificial light is somewhat expensive. The first article on the oxyhydrogen light is in the present number. See Mr. Malone's article on printing by the electric light in a recent number. A simple and cheap method is still to be discovered. The apparatus for the electric light, or any of the proposed artificial lights, is expensive to begin with.

Modest.—The charges of different artists vary materially. The cost of such negatives as you name would usually range from one to three guineas.

H.—We have never succeeded in getting a satisfactory coating of albumen by brushing, nor do we know of any method of effecting it. We have not tried the method to which you refer. The only plan we can suggest is to float and endeavour to save your albumen, so as to make it less wasteful. A little camphor added and light corking in a bottle would make it keep a little time this cold weather. Your only other rsource, is to buy your paper ready prepared, and take your chance of its quality. Try the use of arrow-root papers. We have seen some very fine results with it.

Florence W.—Most photographic processes are a little "messy" for a lady's manipulation, but they become much less so after a little practice. There are various modificications of the albumen negative process, and that of Mr. Archer is a very good one. Perhaps the following formula is a little more simple: to each ounce of albumen add a drachm of distilled water containing 6 grains of iodide of potassium, and to every 4 or 5 ounces add one drop of ammonia; beat the whole well and let it stand a day or two. When the plate is coated dry before a bright fire, excite in a bath of nitrate of silver 50 grains, glacial acetic acid one drachm, distilled water one ounce. Wash and dry. Develope with a saturated solution of gallic acid to which a few drops of aceto-nitrate of silver have been added.

T. K.—One of the difficulties in using the oxyhydrogen light is found in the management of the lime cylinders. They will always have a tendency to crack. To avoid this as much as possible always keep them, when not in use in a stoppered bottle to prevent absorbing moisture from the atmosphere. When first using them warm through gently, to expel all moisture, before applying much heat. And, when in use, keep them constantly turned round, as if the flame plays long on one part, it will certainly decrepitate. See articles on the subject.

H. T. B.—The general plan of your house is very good, and we have only one or two suggestions to make. In the first place you will find that the height of the house is too limited generally; if possible, have a few feet greater height throughout. In any case, the proposed "pitch," or slope will be insufficient to keep out wet. It is very important to have sufficient pitch to throw off water at once; without this you will always have leakage, and an accumulation of dust and dirt. On the side where you have no light use a reflecting screen covered with white calico, or what is better, tin foil. This gives a pleasant reflected light, but requires care to avoid too strong a reflection in the eye of the sitter. You will do well to read the description of a glass house in No. 59. The number is in print and can be had without purchasing the volume.

T. P.—You may mix your silver baths without disadvantage; all the free nitric acid may be converted to nitrate of silver by the addition of oxide of silver to the bath. Sheets of bright tin soldered together would make a good reflecting screen, but would require skilful management to avoid getting the reflections too strong, especially in the eye of the sitter. Tin foil glued on to wood would be better.

Stereoscopic Exchange Club.—The member exchanging with N C. Camm, late of Nailston Rectory, will please note that his address is now Well Holme, Brighouse, Yorkshire

J. W. S.—The terms orthographic, orthoscopic, and caloscopic, are given by different makers to similar lenses.

Lex.—The rapidity of a lens, other things being equal, is generally greater in proportion to the shortness of the focus.

F. B. L.—Iron developement usually gives more softness and detail; pyrogallic acid more intensity. The former is generally difficult to use for dry plates.

James Spencer.—There is no necessity to add alcohol to new nitrate bath; and whilst the bath is new, you will not need much alcohol in the developer. You must gradually increase the proportion in the developer as the bath becomes old charged with ether and alcohol.

*** Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 124.—*January* 18, 1861.

THE PHOTOGRAPHIC EXHIBITION.

The annual Exhibition in connection with the Photographic Society is naturally regarded as the epitomized and embodied record of the year's photographic progress; of its scientific discoveries, its practical improvements, and its advance in art-culture. What men of science or practice have proposed, what societies have discussed, and what journals have suggested, recorded, examined, and criticised, we here hope to find in practical results, and, in a very literal sense, "teaching by example."

The eighth annual Exhibition, which was opened for a private view on Saturday the 12th, and to the public on Monday, at the Gallery of Water Colours in Pall Mall, whilst it meets this view very fully in some respects, is scarcely a satisfactory exponent of the year's progress as a whole. Our first impression, after a general inspection on Saturday, was one of almost unalloyed pleasure. We were so agreeably surprised at the general excellence of the exhibited pictures, after a season in every way so unfavourable for the production of good results; we were so well pleased with the *material* qualities—excellent processes, excellent manipulation, excellent lenses—the existence of which so many of the pictures proved; and above all we were so delighted with decided art-progress so abundantly manifested, that we willingly echoed the general remark, "What an excellent exhibition!" It is only on a second and more reflective examination, that the absence is felt of much that is necessary to a complete embodiment of the year's results. There is absolutely scarcely one important novelty exhibited; nor are there specimens of progress of many important branches of the art. There is no specimen of photo-lithography or photo-zincography, although two or three distinct processes have been brought to a very high state of perfection during the year. There is no specimen of carbon printing. There is no specimen of M. Joubert's process of photographic enamelling. There is no specimen of Mr. Sutton's panoramic photography. There is scarcely a specimen to mention of celestial photography notwithstanding the amount of interest attaching to it, in connection with the eclipse of last July. There is scarcely any example—none specified—of the productions of the solar camera. The only novelty of importance is the process of block-printing by Herr Pretsch, of which some promising prints, and the blocks from which they are produced, are exhibited. There are also some specimens exhibited by M. Claudet of photographic portraits in "enamel colours, burnt in by the process of M. Lafon de Carmassac." What part photography plays in the production of these we are not informed; they are exquisite enamel paintings, but by no means examples of photographic veracity, if the portrait of Her Majesty the Queen be regarded as a fair specimen. With the two exceptions we have quoted, there is no novelty whatever; no evidence of the extension of the powers or applications of photography to fresh branches of science, art, or commerce; the whole of the six hundred and twenty-two frames exhibited containing specimens—for the most part very good specimens—of the ordinary and well known processes of photography.

The result of an analysis of these six hundred and twenty-two specimens is somewhat singular. Of the total number not less than five hundred and fifty-two are by the wet collodion process; twenty-eight by the collodio-albumen process, of these twenty-eight, seventeen are by Mr. Mudd; twenty by the metagelatine process, eighteen of these being by Mr. Maxwell Lyte; eight by the Fothergill process; nine by the waxed paper process, of which eight are by the Rev. T. M. Raven; two are by the malt process; two by the honey process; and one by the oxymel process. Whilst the wet process claims such a pre-eminence in the number of its representatives, we can by no means accord to it the same position as to excellence; the number of specimens being borne in mind, dry collodion takes much the foremost rank. It is a somewhat invidious task to award the palm of highest merit where there are a dozen of unexceptionable artists; but deciding by the specimens now exhibited, we should give decided priority to the works of Maxwell Lyte, James Mudd, and Francis Bedford; or to Mudd, Bedford, and Lyte; or to Bedford, Lyte, and Mudd, for the three are equal. The specimens of these gentlemen represent three distinct processes, the wet collodion worked by Mr. Bedford, the collodio-albumen process worked by Mr. Mudd, and the metagelatine process worked by Mr. Lyte. Nothing could be a more satisfactory verification of the idea so frequently enunciated in these pages, that it is not so much in processes, as in the cultivation of artistic taste and manipulatory skill that excellence depends. The pictures of each of these processes, abound in everything, constituting good pictures; the most perfect photography guided by thoroughly artistic feeling. We might mention a host of others whose productions are scarcely inferior: Fenton, Robinson, Bisson Freres, Wilson, Wardley, Bourne, Cundall and Downes, Heath, Campbell, Dovizielli, Fry, Gillis, Piper, and others.

The general impression the Exhibition conveys is, that it is a very full one; and although containing so many pictures of equal merit, that it is on the whole as very well hung as the limited size of the room will permit. Those pictures possessing manifest pre-eminence in merit have generally the best positions, and we have not noticed, hitherto, any picture especially deserving examination that is hung beyond the reach of such scrutiny.

Amongst the most noticeable pictures, especially as to size, are some immense pictures by P. Dovizielli; one of the Coliseum at Rome, (30,) is especially fine, and a very perfect vigorous photograph: it possesses, alas!—for we must always express our feeling on this subject—a white-paper sky. St. Peter's, Rome, (52,) is a similar picture with scarcely as much merit.

One of the next features that strikes us is the increase in the number of reproductions, especially from paintings. We must confess to a considerable pleasure in this fact, as we regard this as capable of becoming a still more important branch of photography, and think it worthy of every effort to overcome the varying photogenic action of colour, so as to secure perfect results in this direction. Where this can be done, reproductions, giving the exact touch and drawing of the master, must, as we have before observed, possess a value and an interest impossible to attain by any other means. Amongst those excelling in this department, Messrs. Cundall and Downes occupy a foremost place in this Exhibition, followed by Ponting, J. Hogarth, jun., Dovizielli, Caldesi, Hering, and others.

In the centre of the wall at the top of the room—by common consent regarded as the place of honour—is hung Mr. Robinson's "Holiday in the Woods." We congratulate

Mr. Robinson on several points in connection with this picture: in the first place that he has printed it so well. We remarked in our recent criticism on the composition that we were sure Mr. Robinson could produce a better picture from the same negatives: in the print now exhibited, he has certainly done so, and the result is almost faultless; rich and harmonious in tone; at once atmospheric and vigorous; artistic and natural in grouping, fine in chiaroscura, it stands prominent amongst surrounding pictures, as full of life and sunshine. Its effect is much enhanced by the excellent taste of the mount and frame. We congratulate Mr. Robinson on the real excellence and on the general effect, and especially on the high appreciation it has received both from the general public and connoisseurs. We have but one fault to find: the price —twenty-two shillings—is altogether inadequate; it is worth two or three times the money, and we should scarcely conceive that it can be remuneratively produced for less. The Top of the Hill, (465,) by Mr. Robinsou, is also a very fine picture.

Mr. Mudd exhibits a number of such charming pictures, so well selected from such lovely spots, so carefully manipulated, and withal pervaded by so much real artistic feeling, that it is difficult to individualize and say this or that is best. There are two, however, that especially rivet our attention each time we approach: the first, "On the Greta, Robely Park," (103) is full of poetry; we never tire of looking at it, and although not a large picture, we are much disposed to regard it as the gem of the Exhibition. The second, scarcely inferior, is entitled, "In Teesdale," (183.) Mr. Mudd's landscapes throughout, apart from the excellent photography, are charactenised by a delicacy of treatment and fine artistic feeling, rarely equalled.

Mr. Fenton is a large contributor, and amongst his contributions are some wonderful studies of still life, which for admirable grouping, delicacy, softness, and truth, have never been equalled. A contemporary has remarked, "How delighted Lance would be with these!" We have heard it whispered—and we repeat the whisper in no derrogation to the photographer—that Lance had really grouped some of the studies. Be that as it may, they are worthy of him, and well worthy of the fame Mr. Fenton already possesses as an artist-photographer. The delicate bloom on the magnificent fruit, the graceful blending of the exquisite flowers, the crisp carving of the ivory casket, are altogether inimitable. In the resolute determination to avoid the common sin of such subjects—hardness, there is, perhaps, in some of these a slight tendency to a uniform looseness of tone and want of vigour, especially where the sparkling high lights of cut glass are rendered by flat tints of grey; but we may mention one, "A study of fruit, &c." (150), that is quite free from this fault or any other: it is full of delicacy and softness, combined with brilliancy; and the grouping is, we think, absolutely perfect. In landscape, Mr. Fenton is scarcely to felicitous as usual; and this fault of monotony, heaviness, and want of vigour, is, in some specimens, painfully apparent. They are valuable, however, as illustrations of the power the photographer may really possess in this direction, which is not a common one to err in.

Mr. Wilson has contributed some of his charming instantaneous effects, small in size, as gems often are, but exceedingly beautiful.

Mr. Bedford's pictures, of which there is a goodly number, are all fully equal to his own standard, and that is saying much; some indeed surpass what we have before seen.

Mr. Maxwell Lyte's pictures are the finest we have seen him exhibit; in one especial characteristic we think they take the lead of the exhibition: we refer to breadth and richness of chiaroscuro.

Mr. Fry has some good pictures of which, perhaps, the best is St. Nicholas Church, Brighton (92). This is a large picture, 16 by 12, we think, very brilliant, vigorous, and perfect as a photograph. The introduction of natural clouds from a separate negative—the legitimacy of which, is at the present moment a moot question—is here managed with excellent effect and contributes to the harmony of the picture.

A very charming picture, the auld Brig o'Doon (433), which Burns has rendered immortal in his Tam O'Shanter, is exhibited by Mr. David Campbell.

In portraiture the Exhibition is not one whit in advance of previous years; we should scarcely err iu saying it was not up to the former mark. Some of the best portraitists have, for some reason or other, abstained from exhibiting this year; and some who do exhibit have made no advance whatever, whilst the art *has* progressed. Maull and Polyblank exhibit several portraits which are as good as those of some years ago, and no better. Mr. Wright, who writes himself "artist and photographer," exhibits some portraits which prove he has much to learn in both branches of his profession. Messrs. Caldesi and Co. exhibit a very charming portrait of a lady (447) which, despite some faults in the background accessories, possesses many qualities worthy of attention. Mr. Hering has a frame of portraits of children, exquisite in pose, expression, and general delicacy of treatment.

Mr. Claudet has some very fine coloured pictures; amongst them an enlarged portrait of Lord Macaulay, coloured in oil which excites much attention. This picture possesses sufficient that is excellent to make us regret exceedingly that it is as a whole a failure. It is in the first place enlarged to a size just below that of life; which is, therefore, suggestive of boyhood; and the colouring, although fleshy and natural in hue, has so far destroyed all the strong lines and characteristic markings of the face, as to add very materially to the boyish effect of the size; whilst the grey hair has a singularly incongruous effect in conjunction with the general aspect of juvenility.

There is a large display of *cartes des visite*, as it has become the fashion to call these Lilliputian portraits. (Are they really ever used as such?) Many of them are very good: perhaps those exhibited by the London Stereoscopic Company are the finest; the mounting of these latter are deserving of especial praise.

We have already more than exhausted our space in giving some brief hints of our first impressions. In future articles we shall return to the subject in more detail and regular order.

We miss from the catalogue many of the old names which used to grace it, amongst whom we may mention Rejlander, Rosling, Lake Price, Grundy, Llewellyn, White, Williams, Delamotte, Frith, and others; aud we miss, also, some of the processes which at one time were represented: but in no other Exhibition do we remember such a prevalence of real pictorial excellence, so few white skies, and so little "soot and whitewash."

EXHIBITION OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

THE Exhibition of photograpns of architectural subjects in connection with this association was opened in Conduit-street, on the evening of Tuesday, the 15th instant. As a whole the Exhibition is superior to that of any former year, and displays a greater number of fine interiors than were perhaps ever exhibited. We find the familiar names of Bisson, Fenton, Bedford, Mudd, Dollamore and Bullock, and others, and we are glad to add especially, Mr. Frith, who puts in no appearance at the Society's Exhibition. There are some exquisite interiors of Canterbury Cathedral by Mr. Austin, a gentleman whose name we do not remember before to have met with, but who possesses especial excellence in this branch of the art. We shall notice the Exhibition in detail in a future number.

PHOTOGRAPHIC BLOCK PRINTING.

In a recent article, entitled "A Glance at Photography in 1860," referring to Herr Pretsch's process of surface printing by blocks, produced by the combined aid of photography, and the electrotype process, we remarked that "the first specimen we saw, which was printed with great care, and issued in the *Journal of the Photographic Society*, possessed many excellences, and was full of promise; the last specimen issued, in our Liverpool contemporary, was so much inferior, that it tended to destroy that promise."

Our contemporary thinks there is some unfairness in this notice, and states, that "if the editor possessed the necessary technical knowledge, in common fairness he ought, for Herr Pretsch's sake, to have stated the whole facts." Those facts are, that the first named specimen was printed at the ordinary printing-press, not in conjunction with other type, and the latter was printed by machine, "made up in forme." with the ordinary type of the *Journal*.

Now we must state at the outset, that our contemporary has, not willingly we hope, misconceived us, and proceeds to speak of the *two* specimens which appeared in that *Journal*. We only referred to one, the latter. The first specimen which appeared in the *British Journal*, we unhesitatingly and with pleasure admit, was full of promise. We did not refer to it, for this reason: we were not entering into any general criticism of the subject, but "glancing" at it, and therefore referred to the best and worst specimens. We were not referring to the qualities of the printing at all, but simply to the subjects, and to us it was so much a matter of course to note and allow for the technical differences in production, that we should never have dreamed of it being necessary to say we had done so. A quarter of a century's constant familiarity with the penetralia of a printing-office, is apt to breed a slight obliviousness of the necessity for technical explanations, which to persons whose knowledge of the subject is more limited and exoteric, appear, and really are, important. We will, therefore, state a few details, for the information of our readers.

In the ordinary process of letter-press printing, wood engravings are generally the subject of especial care: and where artistic excellence exists in the engraving, and is required in the prints, many hours are frequently spent in the process of what is termed "making ready," in order to "bring up" the block so as to secure the full rendering of all its beauties. This is work which belongs to the "pressman," after the engraver has completed his part of the labour; it consists chiefly in what is termed "overlaying," &c., and is somewhat similar to the stopping out, masking, &c., of the artistic photographic printer, the object being to secure increased pressure on parts requiring especial force and vigour, and less pressure on the more delicate and tender parts. This done, the printing is usually effected by the ordinary hand-press, in conjunction with letter-press or not, as may be required, and, where the best results are desired, with extra good ink and on good paper. Where the quality of the work is of less importance, it may be printed by machine, but the same excellence is not attainable in that case even with the utmost care. Until recently it was not considered possible to print wood engravings by machine with any degree of success; but the improvements of late years in machines, made especially for that purpose, to meet the wants of illustrated papers, have effected a considerable revolution in this respect. In blocks especially cut for machine printing, a certain style is adopted in the engravings, suited to the peculiar exigencies of the case; and where the best effect possible with the machine is aimed at, an especial arrangement exists for the prevention of what is termed by the printer "setting off," a defect which issues in the blurring of a part already printed by the pressure of printing on the opposite side. Still, where the best results of which an engraving is capable are desired, the hand-press is invariably used.

Now the specimen of Herr Pretsch's process, issued in the *Journal of the Photographic Society*, was printed by hand-press, and, as we may reasonably suppose, with all the care usually given to first-class wood engravings: the specimens issued by our Liverpool contemporary were both printed by machine, the first by a "platen" machine, the second by the ordinary "cylinder" machine. The "platen" machine, we must explain to our readers, most nearly approximates to the character of the hand-press, inasmuch as the pressure on the "forme" is effected by the steady descent of a flat surface, or "platen," as in the ordinary printing-press; whilst in the "cylinder" machine the pressure is effected by a revolving cylinder; and there is more tendency to blurring, and less delicacy in the impressions, a thinner and worse quality of ink being generally, also, necessary in working it. Wood engravings of any artistic value would scarcely ever be printed by such a process. We make these explanations thus fully, because we have no wish whatever to conceal the fact, that Herr Pretsch's blocks were, in the *British Journal*, submitted to a most crucial test; and that the first of them, moreover, making allowance for all this, although not equal to that in the *Society's Journal*, was still full of promise.

Having said this much, however, we must repeat that, all allowances for method of printing being made, the last specimen in the *British Journal* was so inferior, that it tended to destroy the promise of the first specimens, and that simply because it was an unhappily chosen subject for the powers of the process in its present stage. That has been the opinion we have heard universally expressed, both by photographers, artists, and connoisseurs. We regret this the more, because, believing that the process is destined to take an important position, this specimen has produced a most unfavourable impression in the minds of those who are interested in the results, but insufficiently familiar with our art to understand the cause of the failure. From such an observer, holding some position in the art world, we heard the exclamation very recently, that nothing he had seen had so much illustrated the poverty and weakness of photography in this direction, as the illustration in question. We believe that the process is capable of improvement, and that for certain subjects it may even now be made valuable; but we cannot but regret the damaging effect of asserting that the last issued specimen, all drawbacks of printing being admitted, is a fair specimen of the powers of the process. That Herr Pretsch is not of that opinion, may be fairly assumed, from the fact that no specimen of that block appears at the present Exhibition, whilst prints of both the former specimens are exhibited.

We will here add our conviction, with due deference to the opinion of Herr Pretsch, at whose wish our contemporary states the block was so printed, that the test was an unfair and an unwise one, to submit a specimen of a *new* process of engraving to a method of production, which would never be adopted with an engraving of any merit, even where all the appliances of the engraver could be brought to bear in preparing it for the operation.

Since writing the above we have received a very courteous communication from Herr Pretsch, in which it is evident he has come to the conclusion we have above stated, for in intimating the pleasure he will have in placing one of his blocks at our service, the only stipulation he makes is, that we "will bestow on it the attention necessary for printing a fine wood engraving." We hope shortly to present our readers with a specimen, in the production of which the necessary care shall be bestowed.

We have a final word in regard to ourselves. Our good friend the conductor of the *British Journal* thinks we are "rather prone to 'hint a fault.'" We must confess we are rather at a loss to grasp his meaning here. The only fault referred to — the damaging character of the specimen mentioned—was broadly stated, not "hinted," That, in our interest in the fair appreciation of the process, we should point out such a fault, we think Herr Pretsch himself will readily pardon us, if pardon we need. That any fault in the matter, as regards our contemporary, was not either stated or hinted, is to ourselves quite clear; in any case he may accept our assurance that none was intended. When we have to deal with any fault it concerns us to point out, we will not indulge in

"—the kind mendacity of hints,"

but state them honestly and fairly, in the conviction that we are speaking to honest and fair-dealing men, with a common cause at heart, and who will appreciate all legitimate and straightforward efforts to serve it.

Notes and Jottings.

No. IV.

Photo-lithographic Process founded on M. Joubert's Patent for Enamelling on Glass.—Ordinary Photographic Printing in Permanent Colours from the same Source.

The publication of the particulars of M. Joubert's patent for burning the photographic image into glass, suggested to us the idea of adopting similar means for producing a drawing on stone, to be printed from in the lithographic press.

It will be remembered that M. Joubert employs a salt of chromium, in solution with albumen and honey*, which is rendered hard and insoluble when acted on by light, whilst the protected portions retain an adhesive, sticky, surface, to which some vitreous colour is made to adhere, on being applied with a large camel-hair brush.

The method was adopted in our incomplete experiment, was as follows: a piece of paper was coated with a mixture of bichromate of potash, ammonia citrate of iron, albumen, honey and water, and exposed when dry, under a transparent positive. On removal from the printing frame, the portion acted on by light was seen to have been rendered hard and insoluble,—the other portion retaining its stickyness, as in the case of M. Joubert's glass plates. But instead of a vitreous colour, we used a resinous gum, in which to bring out the image, the adhesive nature of the honey in the unexposed parts holding it fast.

A finely grained lithographic stone was then taken, and the paper, image downwards, placed thereon; then a moderately warm iron being passed over it, caused the resin to adhere to the stone. Removing the paper, a solution of gum arabic with a very small quantity of nitric acid was allowed to remain on the stone for some little time, and then washed off under the tap. A charged roller being now passed over, the ink adhered to the resin only.

The above remarks are crude and inconclusive, but as at the present time many are experimenting in photo-lithography, we give the result of our research so far as we have gone. Unfortunately, for some short time to come we shall not have access to a lithographic press to continue our investigations.

Taking the same process of M. Joubert's for a starting point, we found it possible to produce a positive print on paper in permanent colour.

A paper was prepared and exposed as in the above case; then, on a stone in the lithographic machine, a portion of the desired pigment, dry and finely ground, was placed, and on it, face downwards, the exposed paper. On passing once or twice through the press, with a moderate, equal motion, the sticky parts were found to have taken up the colour. After coagulating the albumen, the chromic salt was got rid of by soaking in water containing a small portion of carbonate of soda, which, however, caused a slight loss of half tone.

Michael Hannaford.

* See No. 110 of our last Vol.

The Technology of Art as applied to Photography.

by Alfred H. Wall.

Adherence.—A term used to express a want of due relief in a picture's various objects or planes of distance. The word's literal almost explains its technical meaning, although for the purposes of descriptive criticism it is frequently found very serviceable. The defect it represents is by no means an uncommon one in photographic productions. This may arise from the mismanagement of a lens; but it is perhaps more frequently due to a want of artistic taste and knowledge in the operator; who, by obtaining an undue amount of density in the negative, destroys the delicacy of the ærial tones, and thus loses the effect of space. Over printing may also produce such effects, even from a negative of the finest pictorial quality, by simply destroying the detail and vigour of the foreground with a view to giving increased depth and intensity to the more distant parts; which being thus strengthened and rendered harsh, seem unnaturally near to the spectator. Adherence, in landscapes particularly, implies the absence of space or air, which can only be represented pictorially by the delicate influence expressed in the softened and less defined character, or proportionate absence of detail, and the tender gradations of the lights and shades. The too common desire for sharpness in every part of their productions, so commonly expressed by inartistic photographers, is not only opposed to scientific truth, but is utterly destructive of pictorial beauty. In destroying these atmospherical effects, we lose the tender gradations of tone by which the sky and landscape are so sweetly united—the simple grandeur of that all-important quality, breadth—the power of relief, and the poetic influence of harmony or keeping, of which ærial perspective is a most important element. And what is given in exchange for this terrible loss? Simply that which has been so much lauded under the terms *sharpness* and density, of which adherence is the offspring, and are only other words for hardness,—a quality only fit for maps, micro-photographs, and geometrical designs. *Truth, loveliness, and sentiment*, plead with photographers against that hard, cruelly cutting quality *sharpness**. Pray let them not plead in vain. The quality of adherence may sometimes arise from the use of an old collodion, the peculiar condition of the bath or the character of the developer, as these also are liable to give too great an amount of density. A continual source of this defect (adherence) in portraiture, is to be found in the use of what is termed the "French" or "cut-out and printed-in" backgrounds, which, giving a smooth, even, and perfectly flat effect, suggestive of an inlaid condition, rather than that of relief or space, must always be offensive to good taste; even if the staring horror of the cut-out edges substituted for the imperceptible boundaries of vision, be with the aid of an artist's brush somewhat softened. (See also *atmosphere, distance, and relief.*)

Adjustment.—A word which is frequently applied to the choice, arrangement, and disposition of drapery. Although various materials have their individual peculiarities of shape in the folds and breaks they assume, yet, when skilfully arranged with reference to the composition of lines, and the breadth of chiaroscuro, the pictorial result may be very considerably improved; indeed much more so than a mere mechanical operator, who never aimed above indiscriminate copying, would, without seeing, very readily believe. The larger folds of drapery, when confined to the more prominent portions of the figure, do much to aid relief. The smaller folds, by breaking up the masses of light and shade into streaks and spots, destroy breadth. Here the printer may do much by regulating the depth and intensity of shadows, thrown by folds falling within that space of the drapery which is most strongly illuminated, and those folds retiring from the eye, or falling into the general mass of shadow, as his taste, skill and knowledge may suggest.

Adventitious Effects.—Such effects as are foreign to the nature of the chosen subject, although they may be attractive and pleasing in themselves, and even extremely valuable to the picture's general effect, are so called. Such should

* Our esteemed contributor is perhaps open to a little misconception in regard to the term "sharpness." He has no quarrel with the perfection of the quality in its proper place; but with the aim to produce it in a photograph, when to natural vision it would be impossible, and with the disposition to make it take the place of all other and higher pictorial qualities.—Ed.

not be chosen or introduced, however, without the exercise of more than usual care.

Ærial Effects.—A term which, in its more general sense, bears reference to ærial perspective; but which is also frequently used as bearing more especial reference to the various accidental effects arising from certain peculiarities of atmospherical condition. This term is also used as descriptive of effects in which the artist, to secure a supernatural or dreamy, indefinite result, substitutes an ærial character for the qualities of solidity, opacity, and weight. In photography such effects are obtainable by the very simple and well-known method used for the introduction of ghosts, angels, &c.* When the atmosphere, being more than usually charged with moisture, possesses a greater amount of density, it will give to certain scenes various peculiar charms which they possess at no other time, and these will be more commonly recognised by the painter under the term of our text. A similar effect is also produced when the opacity of the atmosphere is increased by being more directly under the influence of direct sunlight. Ærial effects are frequently very novel and picturesque, and although they more properly belong to the accidental category, are quite as frequently described as ærial,† and certainly are connected with both.

Æsthetics.—This term indicates the philosophy of the beautiful. Being adopted into art nomenclature, it is received as indicating poetical or refined feeling and sentiment. The theory of the beautiful, however, is so frequently lost in a species of metaphysical mist, that photographers, being essentially practical in their general ideas, may be disinclined to give to it that attention which nevertheless it fairly deserves; for the philosophy and poetry of all fine arts must be of importance to those who desire that their works shall express the higher qualities of such productions, whether such works be executed with ink-pen, paint-brush, or sun-pencils. The appointed limits of these papers do not now permit us to dwell upon the importance of such an interesting and useful, although somewhat complicated branch of study to the photographer; but such knowledge once obtained would be found to be as important to photographic as to brush art. The term, compounded, we believe, from the Greek and French, was first used by Professor Baumgarten, of Frankfort-on-the-Oder.

Ærial Perspective.—This treats of the natural appearances presented by objects as they retire from or advance towards the spectator, such appearances being regulated by the quality or amount of the interposed atmosphere. As forms recede from the eye, their lights and shadows are weakened, their local colours degraded, or changed, and their details lost. The opacity of the atmosphere is increased by the amount of humidity, and by the quantity of light which it contains; although, in the latter case, objects do not appear more distant than in a less strongly illuminated medium, because the distant forms are rendered more distinct by being more powerfully lighted. We have certain settled laws of ærial perspective, but, as they continually vary with the changeful character of the atmosphere, they can only be properly learnt by an attentive study of nature. This all-pervading medium it is that limits our field of vision, interposing veil after veil between us and the retiring distances, until the various features of the landscape, being gradually softened and obscured, at last melt away into that vast ocean of atmosphere in which our world itself exists and has its being. The rapidity and influence of atmospherical changes, in connection with landscape painting, is well known to the artistic student of nature; but with photographers this appears to be less recognised, although to them of even more importance, inasmuch as by them ærial perspective is too commonly neglected, as a something which it is quite unnecessary they should know anything about. Landscape photographs, however, being, as I have shown, liable to the fault of adherence, which in their case implies the absence of air, it is evidently a necessary branch of photographic study. Besides, without such a knowledge, how can we test the truth of our productions, which are too much at the mercy of optical, chemical, and manipulatory errors, to be *necessarily* true.

* See page 11, vol. I.

† So much carelessness has been displayed in the application of these and other terms of art, both by painters and critics, that already we foresee that we shall frequently be puzzled to explain the real ideas more commonly implied by certain terms without apparent repetition

PHOTOGRAPHIC CHEMICALS:

THEIR MANUFACTURE, ADULTERATIONS, AND ANALYSIS.

IN the first chapter on this subject it was mentioned that there were two methods for the conversion of the precipitated crude nitrate of silver into pure metallic silver, one of which was described; the other plan, which will be found in many cases even preferable to the plan already given, is the following:—

2. After all the free nitric acid has been driven off from the crude solution of the silver coin in nitric acid, add as before specified to the mixed nitrates a little distilled water (quantity immaterial), and allow it to stand till all is dissolved. Next procure a sheet of copper of sufficient thickness to bear handling without easily bending, and large enough in area to stand upright in a pint jug (say three inches by four). If it be inconvenient to employ such a piece of copper, two or three copper coins suspended by copper wire will answer the purpose; but in all cases the surface should be rendered perfectly clean and bright. For this, immerse the copper sheet or coins for a few seconds in warm dilute nitric acid until the surface is entirely covered with a multitude of very minute bubbles, then remove it and well wash under a tap, and give a final rinse with distilled water. The crude nitrate of silver will by this time have dissolved; add distilled water to the solution in sufficient quantity to make up about half a pint of liquid, and filter into a perfectly clean pint jug; wash the filter well with distilled water, and then place the cleaned copper sheet or coins in the green solution. Immediately a beautiful precipitation of metallic silver in needle-shaped crystals will take place, which will grow in length and bulk until they drop off the copper and are replaced by others. In this manner all the silver will gradually be reduced from the solution, and its place taken by the copper. The complete reaction, however, requiring some time to effect, it will be advisable to cover the jug over with a plate or other cover to keep out the dust, and to place it in a rather cool oven or on the hob for a few hours, in order to make sure that all the precious metal is precipitated. When this is judged to be the case, lift up the copper from the liquid, and with a glass rod or silver spoon gently detach the crystals of silver which are still adherent to the surface of the copper, but not employing sufficient force to rub off any of the latter metal.

When all the silver has settled to the bottom of the jug, gently pour off the supernatant liquid, and test it to see if there be still silver in it by adding a few drops of solution of common salt to it. If there be no white cloudiness produced in the liquid after standing for a few minutes, it may be considered as free from silver, and may be thrown away. If, on the contrary, a precipitate is produced, it shows that all the silver has not been thrown down, and the copper must be again introduced. Supposing that the precipitation has been complete, the jug must be filled up with hot water (common water will do at first), and the silver well stirred about in the liquid with a silver spoon, and then allowed to settle. The water must then be poured off, and the washing operation repeated for several times. Afterwards it must be washed in a similar way with dilute hydrochloric acid, and then with dilute ammonia, always finishing by two or three washes in distilled water until the liquid, which is poured off, ceases to be alkaline from the presence of ammonia. These various washings, &c.,

may seem tedious; but they are necessary, in order to be sure that the last traces of copper have been removed from the solution. The time occupied about them is, moreover, not much longer than is required to read these instructions, as the metallic silver settles very quickly. When the last washing has been accomplished, the silver will be in a perfectly pure state, ready to be dissolved in nitric acid, and converted into nitrate in the manner directed in our first chapter on this subject.

Mention was previously made of a black or brown powder which sometimes remained when the crude silver was dissolved in nitric acid, in the first instance. This is metallic gold, and in cases where the silver has been of old manufacture—old coin, plate, &c., it frequently is in such quantity as, to become worth extracting. Being insoluble in nitric acid, it is left behind when this metal is dissolved, and may be separated by filtration and washing. As the amount from one operation will, however, be scarcely sufficient to make it worth while to convert into chloride at once, it will be best to preserve it in a bottle until fresh accumulations from the silver residues (which likewise usually contain most of the surplus gold which has not found its way down he sink), have rendered it sufficient to be worked up with profit into an available form.

The processes above given will yield nitrate of silver in the form of a dry white powder; it will, however, be preferable in some cases to have it in the crystalline form; this can be easily effected. Dissolve it by the aid of heat, in twice its weight of water, employing a clean saucer for this purpose, and the water-bath arrangement mentioned in our first chapter. When it has dissolved, filter it; if necessary evaporate it to half its bulk over the water bath, and place the saucer on one side in a cold place for a day, keeping it well covered over with a sheet of paper. At the end of that time the bottom of the saucer will be found to be covered with an abundant crop of fine tubular crystals of nitrate of silver. Gently pour the solution off into another smaller saucer, and tilt the one containing the crystals on one side so that the liquid may all drain away; support it in this position and cover it with clean paper to keep away the dust, and let it remain undisturbed until the liquid has all drained away, and the crystals are quite dry; break them from the bottom of the saucer with a glass rod, and transfer them to a clean stoppered bottle. The solution drained away from the first crop of crystals will yield a further supply, if it be a little more evaporated over the water-bath, and then set aside, as above directed. The remaining solution—the mother-liquor—drained from this second crop, had better be evaporated down to dryness, and employed for positive printing. It ought to be pure enough for the negative bath, if all our directions have been properly attended to, and good and clean materials used; but as any accidental error or impurity will tend to render this residual quantity rather less pure, it will be advisable not to employ it in cases where absolute purity is essential.

If it be desired to carry the refinement to the highest possible point (although to our mind purifying an already perfectly pure salt, is about as useful an employment as gilding refined gold, or painting the lily), the nitrate of silver may be *used*. For this purpose it will be useless to take the salt crystallized as last recommended, although some operators advise that; but the dry residium remaining after the solution of the purified silver in nitric acid has been evaporated down, may not unfrequently be fused with advantage. If the nitric acid be not pure, or there is a doubt whether organic matter has got in, fusing will be beneficial. For this purpose, scrape the dry salt out of the cup, by means of a silver spoon, and transfer it to a thin unglazed porcelain dish, used for chemical purposes. (A dish must be purchased especially for this, as common earthenware, or china, will be attacked by the fused salt.) When all the salt has been placed uniformly over the bottom of the dish, cover the latter with a large piece of mica to keep out dust, and still enable the operator to watch what is going forward; and then, having supported the dish on a convenient support (a metallic triangular plate-holder on three legs is as convenient a support as any), gently warm it with a spirit lamp. In a short time the mass will commence to liquify, and gradually the whole will become fluid. The heat should be continued until there is not a solid particle in the dish, but not long enough to cause any evolution of bubbles, as that shows that decomposition is beginning. As soon as it is all quite liquid, remove the source of heat, and allow it to cool. When quite cold, dissolve in twice its bulk of water, and crystallize in the manner recommended above. The first two crops of crystals—if the operations have been properly conducted—may be looked upon as the purest form of nitrate of silver which it is in the power of chemistry to produce.

PHOTOGRAPHY WITHOUT A CAMERA.

A photographer without incumbrances would be the happiest of mortals. Could he but start on an excursion with as portable an outfit as a sportsman or an angler, his vocation, now so serious, would become a mere pastime. By the rapid and remarkable progress photography has made within a few years, the fruit of the experience of numerous skilful artists, aided by ingenious constructors of apparatus, we have attained unhoped-for results. Yet this supreme success is not accessible to everyone engaged in the practice of the art, but still remains the privilege of those masters who have devoted long years of patient labour and intelligent skill to the perfecting of methods and processes.

Among the impediments to the universally successful practice of photography, the most important to the peripatetic artist are, the weight of the baggage, and the necessity for a dark room in every locality where it is decided to operate. Many ingenious attempts have been made to obviate the one, and provide a portable substitute for the other; hence the numerous portable cameras, portable tents, dark boxes, &c. &c., which solicit the suffrages of the ardent photographer. The use of dry plates, it was thought would reduce the baggage to a tolerable minimum; but the problem to be solved was—to operate with wet collodion in the open air, without tent, dark box, camera, or any of the baggage indispensable in the usual processes, and to obtain positive proofs in the space of two or three minutes, by means of apparatus reduced to dimensions so small, that, with every necessary, it might be carried to and fro without the least inconvenience. Mr. Claude Pallu claims the merit of having solved this problem.

Any important simplification of the photographer's apparatus necessarily entails a simplification in the manipulations to be performed, in the preparations necessary to be made, the suppression of most of the usual precautions to be taken, and consequently, the suppression of an important part of the operator's difficulties.

Thus photography would become "easy to everyone," but more especially so to the traveller and tourist, to those who admire and enjoy works of nature and art, and who desire to possess a simple instrument, at once portable and convenient, with which to operate quickly in broad daylight, and obtain by it positive proofs without the necessity of having recourse to the usual precautions, and this in whatever place the operator may chance to find himself, whether on mountain top or grassy plain, by hill or valley, running brook or flowing stream, without camera or anything that even the most captious would regard as an encumbrance.

This is a very attractive programme, and Mr. Claude Pallu conceives that he has performed it to the letter.

The apparatus he has contrived is of remarkable simplicity; it is easily managed, and with it focussing presents no difficulty, while the necessity for the operator's putting his head under a black cloth is obviated. This operation of focussing like all the others, is performed uncovered. The upper portion of this apparatus is formed by two sliding shutters, placed horizontally, and independently of each other, so that either can be removed without allowing light to enter the apparatus. This apparatus is a simple square box, to which the lens is fitted, and within which another box, carrying the ground glass, is made to slide, and which can be replaced at the proper time by the sensitized plate to obtain a picture.

The preparation of the sheets or plates to be sensitized is performed in a vertical gutta-percha bath, only having, at its upper part, a kind of longitudinal flap, the edges of which, folded internally, descend to within a certain distance of the bottom of the bath, and constitute a sort of channel or slide in which the sheet or plate is held vertically. A little piece of apparatus of the same height as the bath, called the *port-proof*, is made to cover or envelope the bath entirely, inside the top of which is a hook, by which the plate to be sensitized is held: a horizontal slide covers the lower portion, or bottom of the *port-proof*, which, when pushed over the bottom, hermetically closes this cover, and protects the plate within from any access of light.

When about to operate, the *port-proof* is adjusted to the apparatus carrying the lens; the first shutter of the box is now drawn out, and then the second, and immediately afterwards the slide at the bottom of the *port-proof* is drawn; the sensitized sheet or plate falls into the place it should occupy in the apparatus, into which it is guided and held by two grooves. The second shutter of the slide is immediately pushed back, the *port-proof* is raised, and the first plate pushed in; the apparatus is now hermetically closed. To operate, the lens is uncovered by raising, by means of a cord, a shutter placed in front, which slides in two grooves on the anterior face of the box. When the exposure is deemed sufficient, the shutter is allowed to fall again in front of the lens.

The picture obtained requires to be developed as usual; the box carrying the lens is reversed over a bath or dish similar to the first, containing the developing solution; the two shutters of the dark slide are withdrawn, and the plate falls of its own accord into the bath; the plate is next passed into the bath containing the fixing solution.

These successive operations are performed much quicker and easier than they can be described; indeed, the celerity with which the operator can act must be seen to be believed. The substitution of the little piece of apparatus called the *port-proof* for the camera is as ingenious as it is useful and advantageous, for it enables the operator not only to perform all the operations in broad daylight, but it also affords him the means of working without touching the silver bath or plate with the fingers: thus silver-stained hands are entirely avoided, which is no mean recommendation for lady amateurs and drawing-room operators.

To this array of advantages may be added still another; that of the facility it affords to every one desirous of obtaining photographic views, portraits, &c. The method is specially applicable to stereoscopic views. All the necessary apparatus may be contained within a space not exceeding eight cubic inches. It would seem impossible to reduce the photographer's encumbrances within a smaller compass. —*Science pour Tous.*

[We observe that the invention of M. Claude Pallu has just been made the subject of a patent in this country.—Ed.]

LUNAR PHOTOGRAHY.

BY SAMUEL FRY.*

The variation in size of the lunar negatives is much greater than would be supposed at first, but is of course owing to the moon's varying distance from the earth. I have here one plate of glass for comparison, a negative of the full moon taken at the period of perigee, or its nearest approach to the earth, and also one taken at apogee, its greatest distance. You will observe that the difference is very considerable, and in the after process of enlarging, where a stereoscopic combination is desired, the qualities of the two negatives are very different also, from the details of one being much more condensed than in the other, the enlargements will also differ to some small extent when brought up to the same size.

The principle of binocular vision is now well understood, and though the means taken are very different, yet the principles involved in taking a stereoscopic combination of the moon is precisely the same as employed in our binocular cameras for ordinary pictures. Though the moon is by far the nearest to us of any celestial body, yet such is her enormous distance, that even if simultaneous pictures could be taken of the satellite, with telescopes placed at the extreme diameter of the earth, 8,000 miles, the stereoscopic effect would be very slight; the method adopted is therefore to take advantage of the librations of the moon, and by obtaining pictures at different epochs, to afterwards unite them in the stereoscope. The libratory motion of the moon amounts in the maximum to $\frac{1}{8}$th, or rather more of the whole apparent lunar surface, but the period of time occupied in travelling from one extreme to the other is frequently very considerable, from the change or position being both in latitude and longitude a still longer period must elapse. By this I would imply that the distance of time is often considerable at which it is necessary to take pictures for a stereo combination, in order to have them at the same age of the moon, the average time occupied in travelling from one extreme of libration to the other is not more than 14 days; so that if we take, for example, 6 lunations, and a given age of the moon, say 60 hours after full, it will be found frequently that for several consecutive months the variation is so slight as to give no stereoscopic effect.

The most successful combination I succeeded in making was one in which the first negative was taken on November 23, 1858, and the other side of the combination on October 11, 1859, being an interval of nearly 11 months, and which, as may be seen in the stereoscope on the table, is sufficient to give powerful relief. I think it a point of great importance to display clearly in lunar photographs the details of the surface, as well as the general effect to be good. I have here the original negative of the right-hand picture of this combination, and it will be seen that the display of volcanic craters, mountain ranges, and even in many instances the interior cones of eruption are very striking. The period chosen for this picture is about 60 hours past the full, a time in my opinion very admirably suited to obtain good images, and when the solar light falls on the moon with sufficient obliquity to produce strong effect of light and shade, at the same time that it is almost, if not quite the nearest to full moon at which may be, reproduced at the gibbous edge, those exquisitely sharp cusps and volcanic craters. The time of exposure required to produce a good picture is of course different, according to circumstances, and the age of the moon, perhaps an average exposure at full, was about 3″. I have succeeded in taking a very fine negative in a single second, but under very favourable circumstances.

I have here a negative of the crescent moon, 4 days old, which required 45″ to be successful, and even then, but little detail is seen; the half moon required about 12″ on an average. I have invariably found that when the actinic power was highest I obtained the best pictures, as it is then there is least chance of any difference in speed between the telescope and the satellite.

I also exhibit here a series of negatives, of the eclipse of the moon in February last; on the left-hand picture, the penumbra may be clearly seen, just commencing, and on each of the others, further advanced till the last, beyond which I was unable to obtain any result, in consequence of the reddish copper-colour of the moon, which appeared to leave after this point, no photogenic action. The enlargement of the moon, which is before you, together with the print from the original negative, is from a negative taken on the evening of the eclipse before it commenced, and shows more of the moon, surface than at ordinary full moon, on account of the moon, earth, and sun, being at that time so nearly in a line, and thus allowing us to see very nearly the entire illuminated circle. However accurate, and however unremitting may be personal observation of the lunar surface, it must in many important respects yield to the photographic representation, by which any disturbance thereon cannot fail to be brought under our observation, and a series of pictures extending over a length of years, must of necessity be of the utmost value for future comparison.

* Read at the meeting of The London Photographic Society, on Tuesday, Jan. 8, 1861.

The enlargement, and subsequent uniting, stereoscopically of lunar pictures, is one of the most tedious and difficult operations the photographer can encounter; it is very unlikely that the two negatives are quite the same size, and still less likely that they have exactly similar photographic value, and yet, to be perfect, they must be made to intimately correspond in size and colour. My own practice, as being shortest ultimately, is to enlarge in the first place each negative separately, to about $1\frac{3}{4}$ inch, thus making a transmitted positive; these are again enlarged to 2 inches diameter, giving this time a negative, and the operation must be repeated until these two negatives have equal phtographic value. They are then mounted sterercoscopically on a stereoscopic plate, and fixed in front of an enlarging camera, in a slide made in such a manner that either image may at pleasure be drawn opposite the axis of a lens, placed midway between the negative and the ground glass.

Each side of the moon is copied separately on a piece of glass, and the transparent positives, thus obtained, are afterwards cut with a diamond to fit a mount, having a circular opening for each side; they are then bound in the same way as book-covers, and are complete: but the utmost care is necessary in mounting the two halves to obtain true sphericity in the stereoscope, as the slightest aberration causes apparent flattening of one part of the moon, and excessive convexity in another.

Proceedings of Societies.

City of Glasgow and West of Scotland Photographic Society.

Instead of the usual monthly meeting in January, this society resolved on holding a soirée and conversazione. It came off on Wednesday evening, the 9th, and, notwithstanding several untoward circumstances, was quite a success. The late hard frost had frozen the heating apparatus in the hall, in which the soirée was to have been held, and the only other available room was too small, and in no way so well suited as the one originally fixed on. The severe weather had also the effect of preventing a considerable number of members and friends from being present, from indisposition, particularly three members of council who had been active in making arrangements for the success of this, the first soirée of the society. These were Messrs. H. Wilson and A. Mactear, and the honorary secretary Mr. John Cramb, who had been appointed to deliver an address.

The chair was occupied by the president, John Kibble, Esq., who delivered an eloquent oration on Light. Mr. G. Gilmour gave an account detailing his Photographic experience, and what he saw during a tour on the Continent. Professor Taylor showed a number of photographs by the magic lantern on a 12-foot screen.

The hall and adjoining room were decorated with specimens of our art, contributed by members of council. Amongst them were prominent the numerous views by the President, one of which, 40 inches by 30 inches, was fitted up as a cosmorama, and seen through the magnificent lens with which it was taken looked truly grand. Mr. Kibble's monster camera, &c., with which these pictures are done, is much the largest in the world.

The large dimensions and other features of Mr. Kibble's photographs of the *Broomielaw*, will render a few particulars regarding them interesting. One of them is a glass positive, and is, we believe, the largest on record, and obtained for Mr. Kibble the Manchester medal. The other is in a paper print from a negative by the Taupenot process. The dimensions of the glass are, we believe, 44 inches by 30 inches; the weight of the negative is about 44 lbs. The lens with what these pictures were produced, was made by Ross, and cost £170. The diameter of the lens, clear of mounting, is 13 inches, and its focus, for parallel rays, 6 feet. The camera to which it is attached, was mounted on wheels and drawn by a horse.

Mr. White showed the stereoscopic effect by two magic lanterns very successfully; altogether, the meeting was a very happy one, whether from the fine speeches, fine pictures, or excellent music, or the presence of the ladies, or all combined, we know not, but have no doubt a similar combination will be again tried as the season comes round.

Experimenting in Meetings.—In our notice of a former meeting of the Glasgow and West of Scotland Photographic Society, we were not in possession of a somewhat novel and very interesting feature—the actual manipulation of several important chemical experiments. Mr. Macnab illustrated his paper by the following experiments: dissolving the metallic gold and making a solution fit for use in toning; throwing down silver from its solutions by various methods, as by means of metallic copper, by salt, by muriatic acid, and by caustic potash; producing nitrate of silver by means of nitric acid and washed oxide of silver, and explaining the method of crystallizing, a process in which he had had considerable successful experience. Mr. Macnab's example might, we think, be followed with advantage in other societies.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 16th January, 1861.

M. Augustus Testelin has investigated the subject of the constitution of the photographic image, and attempts to prove:—1st. That the formation of the photographic image is only one among many similar facts, which form a special class, regulated by constant laws, which are but a generalization of the principles of physics already applied in other cases. 2nd. That the photographic image is the result of a physical modification produced by light, and not the effect of a chemical change, as hitherto generally admitted. 3rd. That this physical modification, which results in making the latent image appear through contact with certain substances, is produced by electric polarity, which is due either to luminous radiations or to other causes capable of acting in a similar manner. I can hardly do justice to M. Testelin's researches without following the analytical course he has adopted, and in which he sums up in a very correct and interesting manner everything that is known respecting the physical and chemical action of light; at the same time electrical action is so often adduced as the cause of inexplicable phenomena, that even in this case, the demonstration being inconclusive, it must be received with caution, if not with doubt. At present, we are quite safe with the theory of the formation of the photographic image put forth by Messrs. Davanne and Girard. No other theory yet advanced is so satisfactory or so little liable to objection.

One of our most eminent photographers, M. Nadar, has experimented with Mr. Way's electric lamp in taking portraits at night, and succeeded admirably. The pictures are remarkably sharp, there is good half-tone, and the shadows are not opaque. It is difficult, nay scarcely possible, to distinguish portraits taken with this artificial light from those obtained in ordinary daylight. The invention of Mr. Way is so ingenious that it merits the warmest praise; the idea of turning the fluid mercury to account as an endless metallic wire, is truly a flash of genius, only paralled in brilliancy by the light itself. He has so successfully triumphed over many difficulties in perfecting his electric lamp, that it is not unreasonable to expect he will yet overcome the only one which yet remains, that arising from the volatilizing of the mercury, which creates a white atmosphere round the source of light, and soon envelopes it in a thick veil of mercury adherent to the sides of the glass of the lamp.

Messrs. Berthelot and Buignet have concluded some very important researches upon the phenomena that take place during the ripening of fruits, the principal result of which is, that in the grape the proportion of crystallizable sugar goes on constantly increasing in proportion as it approaches complete maturation. In their researches upon the nature, origin, and transformation of the saccharine matter in fruits, they come to the following conclusions:—1st. The sugar primarily formed in acid fruits is cane sugar, $C^{12}H^{11}O^{11}$, identical in its properties and rotary power with that extracted from the sugar-cane and from beetroot. 2nd. During the ripening of fruits, the sugar is submitted to a peculiar influence, and is gradually changed into reversed (*interverti*) sugar, $C^{12}H^{12}O^{12}$, identical in its properties and rotary power with that obtained by the action of acids or of glucose fragments upon cane sugar. 3rd. When we examine the saccharine matter at the epoch of complete maturation, we find it differently constituted in different fruits. It is in one case found to be composed of reversed sugar, pure and simple, as in the grape, fig, and currant; in other cases, it is a mixture in variable proportions of cane sugar and reversed sugar, as in the apricot, peach, plum, and pineapple. 4th. The ruling cause of these differences is not, as might be supposed, the acidity of the fruits. Experiments prove that the organic acids, on account of their relative proportion, their state of dilution, and the low temperature at which they act, have only a slight action in reversing the cane sugar with which they are associated. Besides, no relation exists between the acidity of the fruits and the alteration exhibited by their saccharine matter. The lemon, the acidity of which is excessive, presents more than one-fourth of its saccharine matter in the state of cane sugar, while the fig, which is scarcely acid at all, presents the whole of its sugar in the state of reversed sugar. So, also, we find 70 per cent. of cane sugar in the saccharine matter of the apricot, the peach, and the plum, while no trace of it exists in the grape and the cherry, our analysis detects much less acidity. 5th. The difference in the relative proportions of the two sugars is due to the influence of a nitrogenous material, performing the part of glucosic ferment, analogous to that recently extracted by Mr. Berthelot from beer yeast. By crushing the seeds of gooseberries, and treating them with cold water, we obtain a liquid which at a common temperature reverses the cane sugar contained in the juice of the fruit. 6th. The comparative influence of the acid and the ferment is rendered manifest by two parallel experiments made in the same fruit-juice: the one in which the ferment was precipitated by alcohol, the other in which the acid as neutralized by carbonate of lime. In the first the saccharine matter subsists for a very long time without sensible modification. In the second, on the contrary, it is completely transformed, even in the course of twenty-four hours. The same effect also results in experiments made with the fruit of the banana. At whatever period of vegetation we examine its juice, no trace of free acid can be found. But yet, in bananas artificially ripened, nearly two-thirds of the saccharine matter exists in the state of reversed sugar. 7th. So close an affinity exists between the cane sugar and the reversed sugar, that it is only with extreme difficulty one can be separated from the other. Thus, cane sugar loses its faculty of crystallizing when in presence of a very small portion of reversed sugar. So also, protoxide of lead, which acts very differently upon the two sugars in an isolated state, exercises the same kind of action upon each when they are mixed together. 8th. The abundance of starch found everywhere in the vegatable kingdom would lead us to suppose that it is the real source of the saccharine matter of fruits. Yet its presence in green fruits cannot be discovered, either by the microscope or by iodized water. On the other hand, the sugar to which starch gives rise in the artificial transformations to which it is submitted, is a dextrogenous glucose with a rotary power equal to +53, while it results from my experiments that that found in acid fruits is partially or totally reversed cane sugar—9th. There exists in green fruits a peculiar principle, endowed with the faculty of absorbing iodine with even greater energy than starch does, and of forming with this metalloid, a perfectly colourless compound. This principle is of an astringent nature, and appears to resemble tannin in most of its properties. Its analysis may be established with much greater facility than that of the saccharine matter itself. In experimenting at different stages of ripening, we recognise that its proportion progressively diminishes in proportion as the saccharine matter augments. 10th. In adding to the juice of green fruit as much iodine as it will absorb, we soon perceive a precipitate formed by the combination of iodine with the astringent matter. If we collect this precipitate and wash it with the greatest care, to free it from the soluble matters it may happen to retain, we find that it produces sugar under the influence of diluted acids at a suitable temperature. 11th. The sugar which the tannin of gall-nuts yields by the action of moderately concentrated sulphuric acid, is a dextrogenous glucose, having exactly the same rotary power as the glucose of starch. The sugar which the tannin of green fruits yields under the same conditions is also dextrogenous glucose, identical with starch-sugar. Under this relation tannin is no better than starch for a satisfactory theory of the origin of sugar in fruits. 12th. In green bananas we find at the same time much starch and much tannin; and the two principles diminish progressively and simultaneously, so that no trace of either one or the other is found in the same bananas ripened. The sugar found in their place is cane-sugar. 13th. There exists, therefore, a very essential difference between the processes of art and the processes of nature, with respect to the transformation of tannin or starch into sugar. There is also a very great difference between the saccharine matter of fruits, according as it is produced under the action of vegetative forces, or out of their influence. Experiments show that the sugar which continues to be formed in the bananas after they are gathered from the tree, is no longer cane-sugar, but reversed sugar.

LONDON PHOTOGRAPHIC SOCIETY.

"WHO'S TO BELL THE CAT?"

Mr. Editor,—I was pleased to read the letter of "Progress" in last week's News. I used to be a member, but dropped it, for the meetings were so dull and heavy, and the "Journal" such a prosy affair; so I joined what "Progress" calls a suburban one, and I like it a great deal better.

We have our monthly meetings, and read our papers, and gossip and chat together, talk about all the new discoveries and re-discoveries, and are very merry and happy, and get a deal of information. It is very different to the dead-and-alive affairs of the old society, where everything used to be as dull as an old country church, and as uncomfortable as a court of justice, and especially when I saw the venerable Judge Pollock sitting on the raised seat before me, I always felt as if I were about to be tried for my life.

"Progress" thinks all the evil lies in the council; if I could whisper a word in his ear, I'd say, "the council is all *bosh!*" I wish he'd attend one of *our* meetings, and see how *we* do it. We are our own council, we put our active men on the committee, and our president is the most energetic and intelligent of us all. We have our journal, not once a month, but every fortnight, and during the year get a splendid photograph, and all this for half the money the *Grandmother* Society, as somebody calls it, charges. So I think it time that the old lady was woke up a bit. We have no grand and solemn self-elected body, sitting in the front seats to manage our affairs for us, and put down anybody who ventures to disturb the order of their proceedings.

This grand council is like the old man round Sindbad the Sailor's neck, it will strangle the society if it don't mind; and if "Progress" can induce the members to shake it off, so much the better for them, but "*Who's to bell the Cat?*"

A Former Member.

ON COAGULATED ALBUMEN, &c.

Jan. 7th, 1861.

Dear Sir,—At the meeting of the London Photographic Society, held on the 4th of December last, I find it reported that Dr. Riley asked,—"Could Mr. Hardwich inform him how it was that the sensitiveness as well as intensity of the plate was increased by the coagulation of the albumen by hot water. Sulphate of iron, acetic acid, and alcohol would produce a similar effect, but not to the same extent." In reply, Mr. Hardwich said,—"that the hot water might perhaps wash away the soluble chlorides and phosphates from the albumen. That might account for the fact, that the coating of albumen, *coagulated by dry heat*, was not so sensitive." Previous to this question of Dr. Ryley's, Mr. Sebastian Davis is reported to have said, "He prepared plates, and *washed away all the free nitrate*, and coated them with albumen. He then placed the plates in an atmosphere of dry air at 180 degrees, *to coagulate the albumen*; on exposing the plates he found they possessed little or no sensibility to the action of light. This would appear to *contradict* the theory, that it was only necessary to coagulate the albumen to produce sensibility. He then dipped some plates in boiling water instead of exposing them to hot air, so as to wash them at the same time. The plates so treated were far more sensitive."

I wish, sir, to draw your attention to the erroneous idea respecting the coagulation of albumen, which the above conversation displays. I will here state the chief characteristics of albumen. The white of an egg is not *pure* albumen, as it contains also, a small quantity of mucus, soda, and sulphur; but as we do not know any method of separating these substances from the albumen without altering its properties, we are forced to treat it in combination with them. Albumen in its natural state, *i.e.*, uncoagulated, *dissolves readily in water;* when dried spontaneously, or in a low heat, it becomes a brittle, transparent substance somewhat resembling gum arabic, and loses about four-fifths of its weight, but *is still soluble in water*. When albumen is heated (*heated* mind, *not dried*) to the temperature of 165°, it *coagulates* into a white sold mass; not only its appearance, but its properties become entirely changed by coagulation, as it is *no longer soluble in water*, either hot or cold, and unlike *dried* albumen, *it has precisely the same weight and bulk that it had when fluid*. Albumen is also coagulated by acids, but in a lesser degree, and several of them have the property of dissolving it when assisted by heat; alcohol and ether will likewise coagulate it, in both of which it is insoluble.

If, sir, the sensitiveness of the plates in the processes where collodion and albumen are used in conjunction, is in any way dependent upon the coagulation of the albumen, it seems but common sense to suppose that the more complete it can be rendered, the greater will be the sensitiveness (all other things remaining the same); at all events, if any amount of coagulation, however slight, will increase the sensitiveness of the plate, the mere *drying* the albumen cannot reasonably be expected to produce the same result, as dried albumen and coagulated albumen, have not any properties in common. Why then, should Mr. Davis say that the non-sensitiveness of his plates with *dried* albumen, appeared to contradict the theory that *coagulation* of the albumen is necessary for their sensitiveness; and why should Mr. Hardwich speak of *coagulation by dry heat*, but for the simple reason that they confound drying with coagulation. The unimportant discussion, as to whether the sensitiveness is due to structural or chemical change in the albumen, could only have arisen from such erroneous ideas, as, in our present state of chemical knowledge, it is impossible to tell from *which* cause it arises, as *both* the structural and chemical properties of albumen are changed by coagulation.

If the *whole* of the free nitrate is washed out of the collodion previous to coating with albumen (as in Mr. Davis's experiment), there is nothing left to render the albumen sensitive, and it, therefore, when dried, will interpose a non-sensitive film between the collodion and the action of light; it thus must necessarily either render the plate wholly insensitive, or diminish its sensitiveness in proportion to the thickness of the albumen film; if, instead of drying the albumen, the plate is dipped in hot water, the hot water probably dissolves some of the nitrate contained in the collodion, which combining with the albumen, renders it sensitive.

It seems also, that very erroneous ideas exist as to the *necessity* for washing out the free nitrate, and for using a second bath, such bath being but a necessary consequence of the washing, as the bath only *restores* to the plate what it had been deprived of by the washing; in proof of this, if the sensitized plate is *not* washed and thus the whole of the free nitrate allowed to remain, *no second bath is required;* a friend of mine has thus prepared his plates *for several years*.

Why does the Fothergill process dispense with the second bath? simply because the free nitrate is not *wholly* washed away, but enough is left after the slight washing in the "diluting" tray to combine with the albumen. The Taupenot process *requires* a second sensitizing bath: but *why* does it do so? because it is in fact *two distinct and separate processes*, the one superposed in the other; we first have an iodized collodion rendered sensitive, and thus complete in itself; *upon this*, we place an iodized albumen, and thereby wholly or partly destroy the sensitiveness of the previous collodion, and having done so, we must of course sensitize the upper or albumen film: thus having *two* sensitive surfaces, one *under the other*, the lower one of no use except to complicate the process, as the image is on the albumen and not on the collodion.

With respect to Petschler and Mann's process, I think that the common-sense explanation of it is, the chlorided albumen film being *insensitive*, the washing it away exposes the sensitive collodion film under it to the action of the light, and as a necessary consequence, no second bath is requisite; if any chlorided albumen, is allowed to remain there must necessarily occur patches of irregular sensitiveness, in proportion to the thickness of the film not washed away; *the image cannot therefore be anywhere else than on the collodion or sensitive film*. The albumen serves no other purpose, than to protect the collodion from the action of the light; and methinks this modification might have been arrived at long ago, by anyone who had taken the trouble to reason as to why the second bath in Taupenot's process is necessary.

Although the subject is anything but exhausted, I fear you will think my letter already too long, and therefore, congratulating you on the completion of your fourth volume, I remain, dear sir, your sincere well-wisher, G. P.

PHOTOGRAPHING ON WOOD.

16, *St. Augustine Road, Camden Square, N.W.*
15*th July*, 1861.

Sir,—In the report of the meeting of the Photographic Society, in your number of the 11th instant, the subject of photographing on wood forms a very important feature. There is, however, one omission which, if not supplied, is calculated to do me great injury—viz., that although photographing on wood has been attempted by various persons, it has only become practicable in my hands, whereas; from the report of the meeting, it would appear that M. Joubert was the successful experimentalist. M. Joubert was, perhaps, not then aware that the designs I engraved for the *Lyra Germanica* were engraved on blocks on which they had been photographed by myself. It is true that those designs were printed on blocks by M. Joubert, but from the imperfect nature of his process, they could not be engraved, and had to be erased to give place to the same design printed by my process. This fact can be attested by M. Leighton, for whom I photographed and engraved these designs.

Trusting to your well-known sense of justice to give me the opportunity of establishing my just claim to the title of being the first to carry this process to a successful issue.—I remain, sir, your obedient servant, Thomas Bolton.

[We feel quite assured that M. Joubert was not aware that Mr. Bolton had produced the photographs on the wood from which the engravings were produced. From the appearance of the uncut block exhibited he had every reason to believe it was the one he had himself done, a conviction which the memory of Mr. Warren de la Rue and ourselves confirmed him in. We feel assured he would be the last person to make a claim to which he was not legitimately entitled. If the process of Mr. Bolton is not a secret, we shall feel interested in receiving some particulars for publication.—Ed.]

Meeting of the Photographic Society.—Dallmeyer's Triplet Lens, &c.

Sir,—It appeared to the chairman that the remarks I was addressing to the meeting last night would originate a discussion which might encroach upon the time that would be required by Mr. Fry's paper. It was for this reason I gave way; I should, however, be glad to take this means of putting myself right with the meeting. Prior to the 4th December last, I gave notice of my intention to make some remarks at the meeting of that date, upon Mr. Dallmeyer's triplet lens; and if the discussion upon Mr. Thomas's paper had not occupied the time it did, I should have done so. I maintain, therefore, that my notice held good for the meeting of last night; and, as I yesterday reminded Dr. Diamond of my claim, I think it will be seen that my proceedings were quite in order. I mention this, because, at the conclusion of the meeting, I was told that what I was doing was irregular, and that the chairman was justified in stopping me. To those who think so I address the foregoing explanation.

As our next meeting will probably be entirely occupied with the business of the annual meeting, I will now ask permission to use the News for the remarks I desired to make last night.

There is no question that Mr. Dallmeyer's triplet lens has its peculiar advantages, and that it provides against certain defects of certain lenses; but I should like to be convinced that it fulfils some other conditions which Mr. Dallmeyer says it does. I do not mean to say that it does not; but I confess that I do not exactly understand what is meant by the assertion that it is "quicker-acting than the orthographic or single combination lenses." Quicker-acting is so peculiar a term, that I ask whether it is intended by it (the size and the definition of the resulting pictures being equal) that the triplet lens will produce its pictures in less time than the orthographic or single lens. My own experiments give a result the very reverse of this; but perhaps I do not understand Mr. Dallmeyer's mode of comparison. I must, however, insist that no comparison can be just, *which does not include perfect equality in the size and definition of the pictures produced.*

I cannot help calling attention to the fact that Mr. Dallmeyer's assertion is not made concerning the Petzval combinations generally, but that, for his comparison with lenses of that principle, he has singled out the orthographic, which is the lens of Mr. Ross. It is really, therefore, but reasonably fair that there should be no ambiguity about the terms or the manner of the comparison made. I will merely add that if it should lay in Mr. Dallmeyer's power to demonstrate the accuracy of his assertions, he will have no cause to regret the remarks I have made here; but, on the other hand, I think that if one or other of those assertions fail to be verified, it will be admitted that the notice I have taken of them is completely justified.

Allow me now to take advantage of this opportunity of addressing you, to call attention to an advertisement in a recent number of the Photographic News, in which a camera is stated to be "the only camera that will stand the climate of India."

Now there is no question that in an advertisement every one has a right to speak of whatever he may produce new and good in the most favourable manner possible; but no one is justified in an assertion which all who are acquainted with what has been done by photography in India and elsewhere know to be untrue, and which can only be hazarded to catch the ignorant.

Time and experience will most assuredly supply the necessary corrective; I must ask you, however, to allow me at once, in my own name, and on behalf of the several other manufacturers whose apparatus has been, and is, most successfully employed in India, to protest against this upstart and unfounded assertion.

Vernon Heath.

19, *Bloomsbury Street, Jan.* 16, 1861.

Sir,—I am sure you will favour me with the insertion of the inclosed letter in answer to Mr. Heath's remark, contained in your report of the last meeting of the London Photographic Society.

At our last meeting, Mr. Heath (Murray and Heath, opticians) attempted to ask some questions apparently respecting a statement put forth in my "advertisement" to the effect that the "Triple Achromatic Lens" constructed by me is quicker-acting than the "Orthographic or Single Combination View Lenses," observing that this had not been verified in "his" experience.

The Chairman here interrupted the speaker, and pronounced the subject irrelevant.

Since, however, the question has been asked, I am sure you will allow me to give the answer.

First, the "Triple Achromatic Lens" is quicker-acting than the "Orthographic," because the relative intensities or quickness of two lenses (having the same number of reflecting surfaces) are in direct proportion as the squares of their apertures, and inversely as the squares of their foci. Now the focal length of the Orthographic, for a given size plate, and with the same aperture, is *longer* than that of my "Triple" lens in the proportions of 10 : 9, and therefore their intensities will be expressed by $1^2 : 9^2 :: 1^2 : 10^2$, or as 81 : 100; in round numbers, as 4 : 5; giving my lens the advantage to the amount of $\frac{1}{5}$.

My reason for making the comparison with the "Orthographic" is owing to the fact that, having assisted my late father-in-law (Mr. Andrew Ross) in its construction, it will readily be conceded that I am intimately acquainted with all its properties.

Secondly, the "Triple Achromatic Lens" is quicker-acting than the Single Combination View Lens, because, for the same size picture, and with equal diameters of stops, its focal length is less in the proportion of 10 : 9·4; therefore, according to the above rule, its intensity in round numbers is greater by $\frac{1}{8}$.

The loss of light, as occasioned by the greater number of reflecting surfaces in the "Triple," is compensated for by the circumstance that, although stops of equal diameters are employed in both cases, yet the size of the pencils of light, as transmitted by the two lenses, is by no means the same: for in the case of the Single View Lens the stop is situated "before" the lens, and therefore limits the diameter of the several pencils before refraction; but in the case of the "Triple" the stop is situated "behind" the front positive combination, where the rays are already converging, and therefore the pencil of light received and transmitted is considerably larger than the diameter of the stop.

I may observe, that what has been advanced above has also been confirmed in the experience of numerous professional photographers, and it was only after that confirmation had been obtained that the announcement was made in my advertisement.

In regard to other good qualities possessed by my new lens, such as perfection of definition, flatness of field, perfect straightness of marginal lines, &c., Mr. Heath does not appear to question; and since photographers and the public generally are already well acquainted with the "Triple Achromatic Lens" and its merits, I will not trespass any further upon your valuable space.

J. H. Dallmeyer.

Apparatus.

Instantaneous Shutter.

A shutter for rapid or instantaneous exposures, with a bi-lens stereoscopic camera, was exhibited by Mr. Dallmeyer, at the last meeting of the Photographic Society. It consists, in its simplest form, of a shallow box of mahogany, made to fit on to the hoods of the lenses, and may be added or removed at pleasure. The lip is moved up or down by a brass milled head, attached to a rod which forms the hinge. In the letter accompanying it, Mr. Dallmeyer said:—

"It needs no description. I will only mention that on throwing the centre of motion somewhat backwards, the lid is always *certain* to close, even if the camera be inclined *downwards* from 5 to 10 degrees; and for the same reason also, when turning the lid up, it *remains* in that position, and thus allows for focussing, or a more prolonged exposure. Also, since by the action of the shutter the foreground receives the greater exposure, it favours the obtaining of a more natural sky in the picture.

"The movement is, perhaps, not quite rapid enough for waves and the like, but for the ordinary *quasi* instantaneous views (appropriately so-called by Mr. Lake Price), it is found quite sufficient."

Where it is intended to be used with cameras having an arrangement for separating the lenses to different distances, it is made entirely of brass, and consists of two tubes moving on a rod to fit the hoods of the lenses.

Whilst referring to Mr. Dallmeyer's new instantaneous stereoscopic lenses, for especial use with which this shutter was contrived, we may take occasion to remark that we have used one of them, for various purposes, with the most complete satisfaction during the last few months, and have found it exceedingly rapid, covering a large angle with perfect definition throughout, and free from distortion. From the unsuitability of the season we have not had an opportunity of trying it for landscapes, but for copying and enlarging we have found it everything we could desire.

Talk in the Studio.

Photography and History. One of the most interesting of all our historical records, the celebrated Tapestry of Bayeux has been reproduced by photography. The photographs, executed by Herr Albert of Munich are just published by Messrs. Bell and Daldy.

A New School of Art is to be formed at Hertford.

The French Emperor and Photography.—His Imperial Majesty the Emperor of the French has forwarded to Mr. Maxwell Lyle a magnificent pin, mounted with diamonds and rubies, in recognition of an album of his marvellous views of the Pyrennees which he had forwarded to the Emperor. The gift was accompanied by some very flattering remarks, to the effect that the more he saw of the beautiful photographs of Mr. Lyte, the more he admired them, and that his congratulations and thanks were addressed, not only to the photographer of works of rare merit, but to a chemist whose discoveries his Majesty knew how to appreciate.

Photographic Piracy.—A deputation of publishers, consisting of Mr. Graves, Mr. Gambert, Mr. Fores, Mr. Lloyd, and Mr. White, waited upon Sir George Cornwall Lewis, at the Home Office, for the purpose of obtaining facilities for stopping at the Custom House, piracies of English engravings; and also a more speedy and less expensive remedy against *photographers* and other producers and sellers of pirated copies of English copyright engravings.—*Times.*

Photography and Fluorescence.—At a recent monthly meeting of the members of the Royal Institution, Professor Faraday exhibited photographs of fluorescent substances, which had been prepared by Dr. J. H. Gladstone. He reminded the members present of experiments they had seen in that theatre, showing that such bodies as di-sulphate of quinine emit a beautiful blueish light when they are exposed to the most refrangibile of the chemical rays of the spectrum, and are also phosphorescent. Several of these are white or colourless to look at, under ordinary circumstances; but it had occurred to Dr. Gladstone that, on account of their lowering the refrangibility of the chemical rays, they would, perhaps, not produce so great a photographic effect as other white substances. He had, therefore, drawn various devices in quinine salt, esculine from horse-chesnut bark, and other fluorescent substances on white paper, and had had the apparently white sheet photographed. The devices all came out dark, as was seen by the specimens exhibited, and, more than that, on a sheet of paper coloured blue with cobalt, were fixed letters, cut out of white, and steeped in the fluorescent solutions above mentioned. When this sheet was photographed, the blue paper was bound to have a much greater chemical effect than the white letters, which, therefore, appeared in the positive photograph dark, on a light ground.

Conceits of the Photographic Gallery.— The editor of the *San Francisco Mirror* remarks—We have never failed to derive amusement from studying the pictorial show-cases of the daguerrean artists. The sublimity of affectation is exhibited there, despite the efforts of the artists who can seldom keep sitters from "making up faces." Very few are content to appear in the pictures as they do in life, but manage to fix up in some absurd or unnatural attitude, which makes the spectators laugh. Some gentlemen affect the literary, and with this intent borrow one of the artist's books to give a show of attachment to letters; others group together, with arms locked, hats on one side of each head, affecting "gentlemen roughs," and others smile in a peculiarly saccharine manner, which, when ambrotyped or photographed, gives the face something of the expression said to belong to dead people found in the poisoned Valley of Sardis. Ladies, too, are not without affectation in attitude, and spoil their pictures by efforts to look unnaturally agreeable. It must be rare amusement for husbands in possession of *impulsive* wives to pass from the nursery, where the irate mother is "sloshin' about" among disorderly young ones, representing the "enraged parient," and find the same face limned on the show-case in all the mildness, suavity, and smiling sweetness of a "swamp angel." But the most pitiable of all sights is to observe that a person on the downhill of life has tried to look young and "peart," instead of manfully or womanly owning up to the full measure of years. Study the galleries attentively, and observe a great diversity of queer conceits and absurd attitudes.

To Correspondents.

W. H. Warner.—The term "transparent yellow" probably refers to gamboge; but we cannot say with any certainty unless you can refer us to the article in which it occurs. The quantity of salt to be added to the water in which prints are washed before immersing in the alkaline gold bath, is not important. With the length of washing you name it need not be used at all. We generally wash in two or three changes of common water for about a quarter of an hour in each.

J. C. A.—See pp. 56 and 372 Vol. iv. of the Photographic News.

S. V. W.—Steam water, carefully collected in a clean vessel, will generally answer the purpose of distilled water. Nitrate of silver is the usual test for the presence of chlorides and carbonates, and produces turbidity.

F. C. Camm.—The causes of the film cracking on drying are various. They sometimes proceed from a faulty collodion; very often from an imperfectly cleaned plate; and sometimes from over-development of an under exposed plate.

R. J.—We gave the formula on the statement of an experienced colourist, and are not familiar with its action ourselves. In our own practice we have used the ordinary megilp made as you describe, with drying oil and mastic varnish, and, used with care, find it answer the purpose satisfactorily. Used in excess, it will, of course, turn yellow and horny. Paper positives can be obtained from a negative by means of an enlarging camera without a condenser. A longer exposure will be required, and printing by development must be adopted.

W. L.—The albumen is best used tolerably fresh; but a slight amount of smell is not a serious objection if it be not decomposed. 2. Use a little brush and a strong solution of soda and water. 3. We cannot tell you whether the preparation to which you refer will answer its purpose or not. The addition of a bromide will often partially restore or increase the sensitiveness of an old iodized collodion which has grown slow by age; and it will assuredly, if added at first, prevent the loss of sensitiveness.

W. S.—White or blue calico is suitable for blinds in a glass room. 2. You can easily prepare oxide of silver by the directions you find in the News; or you may purchase it ready prepared. We have had no personal experience of the lenses you name; but have seen some good pictures said to be produced by them.

C. Eades.—We are not in possession of the information, but will enquire. There is some mistake in forwarding the recipe for paste blacking. We do not remember an enquiry under the signature of "Crispin."

Neg. Blister.—You are by no means singular in your misfortune; blisters in varnished negatives have been a prevalent evil of late. One of the chief causes, has been we apprehend, the unprecedentedly damp season. Imperfect washing after fixation, materially aids in producing this effect The ridges you describe are generally caused by, and contain moisture, which is probably due to some soluble salts left in the film. You will find the subject fully discussed in the Photographic News for Dec. 14th and 21st. 2. Your bath probably contains an excess of organic matter. Expose in a shallow vessel to evaporate the accumulation of ether and alcohol, and to light to reduce the organic matter. Neutralize excess of acid with oxide of silver, not with carbonate of soda, and finally filter. We have found this method restore such a bath as you describe to perfect working condition. It is somewhat difficult to say exactly what substances a bath which has been long in use contains, unless you know the exact composition of all the collodion which has been used with it. *Pure* gutta percha has no effect on nitrate of silver, but some articles sold as gutta percha are contaminated with a variety of substances. You may reduce the amount of acid in your developer in cold weather, but it will not be wise to omit it entirely.

Mr. F. Richards.—We have a letter for this correspondent if he will forward his address. Two or three correspondents have asked for a brief and precise statement of the formula for the albumen process which he uses, as referred to in his recent communication recommending its adoption.

Magic Lanterns.—A reader asks our recent correspondent, who speaks of having made a respectable magic lantern by the aid of his quarter-plate portrait lens, to communicate his experience as to the best mode of setting about such an undertaking. Several of our correspondents have experimented in this direction, who will perhaps aid our enquirer.

Leo. Daft.—Your letter will appear in our next. We shall be glad to receive further particulars.

A Disappointed Visitor.—We cannot agree with you that there is any declension in manipulatory or artistic skill manifested in the Exhibition. There is an absence of many things we should have liked to see present, but most of the things exhibited are really good. If you cannot see the excellence, remember, "the eye only sees that it brings with it the power to see." Borrow from the library of some of your juvenile friends an interesting little work by Mrs. Barbauld and Dr Aikin, entitled "Evenings at Home," and read the article, "Eyes and No Eyes."

G. G.—We will give some hints on French polishing shortly.

J. M.—We are much gratified with your expression of good opinion, because it shows such an accurate appreciation of our aim. Mr Atkinson of Liverpool is an agent for many American goods; but whether for the lenses you mention we cannot say. Many of Harrison's lenses are very good; but there are many equally good makers in this country, and some, we should scarcely hesitate in saying, who are decidedly superior. We have worked with Harrison's lenses and know them.

A few Amateur Subscribers, Zaffar, E. A. H., and others in our next.

A. L. Z.—See pp. 56 and 375 of vol. 4 of the Photographic News.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to the Office, 32 Paternoster Row, London.

Advertisements and Communications for the Publisher for the current number, to be addressed to the Office, 32 Paternoster Row, not later than 3 o'clock every Thursday. Post-Office Orders are to be made payable to Mr. Thomas Piper, at the Money-Order Office, St, Martin's-le-Grand.

THE PHOTOGRAPHIC NEWS.

VOL. V. No. 125.—January 25, 1861.

THE EXHIBITION OF ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

THE Exhibition of the Architectural Photographic Association is this year incomparably the best yet held under its auspices, and is decidedly better in relation to its scope, than that in connection with the Photographic Society, regarded as an exhibition of the general powers of the art. Many of the pictures here exhibited leave absolutely nothing to desire in connection with the perfect rendering of architectural subjects. How far it is true that the depicting of architectural subjects is the most legitimate *metier* of the photographer as some hold, we will not say; but this, we think, will, by most persons competent to judge, be readily admitted, that higher perfection has been attained in this branch of photography than in any other.

Taking incomparably the first rank here, we think, are the productions of Francis Bedford. And, before proceeding further, we must enter our indignant protest against an opinion we have heard more than once expressed, and which we find declared in a very matter-of-course way in one of the morning papers, namely, that the productions of English photographers are vastly inferior to those of their continental compeers, the French and Italian photographers, and that the works of Bisson show "signs of greater judgment and artistic feeling than can be perceived in the works of our best men." We most emphatically demur to this opinion: recognising heartily all the merits of the continental artists; especially admiring the magnificent photographs sent by Bisson to this Exhibition, which certainly possess the perfection of literal or mechanical photography; we nevertheless unhesitatingly express our conviction that in all points, except size, they are equalled by the pictures of many English photographers, and that in the exhibition of artistic feeling, they are entirely surpassed by the pictures of Francis Bedford.

Architectural pictures may appear, and to a certain extent are, difficult subjects in which to display much artistic feeling. The most perfect literal transcript of the building, with every detail made out, presenting indeed in all respects photographic perfection, would appear necessarily to constitute the best architectural picture; and this may to a certain extent be true. But there is in many of Bedford's photographs here exhibited, such a display of fine taste and feeling in the selection of view, and still more especially in the choice of light and circumstances, as give to his productions a high pictorial value as works of art, entirely beyond their merit as architectural studies. Amongst the pictures of Bristol Cathedral, No. 229, "Entrance to the Chapter House;" No. 231, "The North Aisle;" and No. 228, "The Archway to College Green," are especially worthy of attention. Amongst the views of Wells Cathedral are some especial gems, amongst which No. 251, "The West Front;" Nos. 253 and 254, "The North Porch;" No. 256, "The South Aisle," and some others in the same series will excite admiration. Some of the most exquisite things, exhibited by Mr. Bedford, are the photographs from the interior of St. Paul's of the fine carvings of Grinlin Gibbons: these will well repay the most careful examination. Some views of the Cathedral at Canterbury, and the Rivaulx Abbey, are also very fine.

Perhaps the largest exhibitor, in every sense of the word, both as to number and demensions of his productions, is M. Bisson, who contributes not less than sixty-five specimens, the majority of which are of very large size, and, a we have before said, of undoubted excellence. "The Entrance to the Imperial Library of the Louvre," No. 5, is a magnificent specimen of photography, as are the various views of Rheims and Rouen Cathedrals. Notwithstanding the large size of many of these, which are not less, we imagine, than twenty-fonr inches square, they are free from distortion, and exhibit perfect definition to the corners of the plates. Taken in full sunlight, they are brilliant and vigourous, whilst there is not the smallest patch of light without detail, nor of black shadow without drawing. The shadows indeed are exquisitely transparent, the eye being carried by tender gradations into their deepest gloom. There is moreover a relief and a vigour combined with the utmost microscopic delicacy of detail, rarely met with, which give to these specimens of the best period of Gothic architecture —we are especially referring to the Rouen pictures—an especial value to the connoisseur. Almost all Bisson's pictures present very excellent photography, but there are some in which the distortion produced by the lens, or the misuse of it, is very offensive. No. 53, "The Great Clock, S. Ouen Cathedral," is a glaring example of what, using a solecism, has been called, "converging perpendiculars." We are somewhat surprised to find that Bisson, whose very large pictures are so perfect in every respect, should exhibit a number of moderate-sized ones so strikingly faulty.

M. Legrey exhibits a few fine and large specimens of Notre Dame, which will receive much attention. No. 79 is a very noticeable picture, not only as an excellent photograph, but from the extraordinarily grotesque character of its subject, which forms part of a carving of the last judgment, in the old Parisian Cathedral.

Messrs. Cundall and Downes have a goodly show of specimens here, many of which are exceedingly happy. The series of Winchester Cathedral please us best, and present some magnificent photography. Mr. Dallmeyer's triplet lens has rendered a good account of itself here, giving absolute freedom from distortion under the most trying circumstances. We must not omit to notice an exquisite little vignette, No. 103, "A View of St. Paul's from the River." The usual explanation is given for vignetting this picture, that the outside was imperfect. We would very much rather believe it was the result of deliberate intention, for it is a case where the sacrifice of part of the negative has produced a real picture, which the full introduction of details might have marred.

Mr. Fenton exhibits a large number of specimens, many of which are very fine, although there is more or less a tendency to the fault of which we have before spoken. "The North Porch, Southwell Abbey," No. 221, is an excellent picture, as is also 224, "Harewood House, from the Parterre."

We have not space here to notice the exquisite Egyptian photographs of Frith, nor the pictures of Moens, Captain Austen, Church, Mudd, Dolamore and Bullock, and others; but must return to them on another occasion.

An interesting feature in connection with this Exhibition is the delivery of lectures, every Tuesday evening, on subjects connected with the various photographs exhibited. The first lecture, delivered last Tuesday evening, was on the Egyptian photographs, by Joseph Bonomi, Esq., who with much lucidity traced the dim antiquity and consequent interest of the subjects of many of the pictures, and the great historic value of the photographs as authentic records of these relics of architecture, which extend back almost into the night of time.

THE PHOTOGRAPHIC EXHIBITION.

Second Notice.

A second examination of the photographs at the Exhibition, brings under our notice a series of specimens which we had at first passed by somewhat hastily, without discovering the amount of real beauty and excellence they possess; we refer to the pictures exhibited by Mr. Vernon Heath, consisting chiefly of views at Endsleigh, the seat of his Grace the Duke of Bedford. The whole of this series are full of picturesque beauty, and are at the same time fine examples of very perfect photography. The series consists of fourteen pictures, each, as we have said, possessing beauties of its own, but of this number, those which please us best are No. 4, in frame 213, "In Dairy Dell," and No. 4, in frame 230, "The Gardener's Cottage." The latter is a most charming vignetted picture; the cottage is embowered in flowers and foliage, and surrounded by trees. We heard it explained that this vignetting was rendered necessary by the imperfections from the movement of the foliage, &c. We are unwilling, for the sake of Mr. Heath's taste, to accept such an explanation. We would much rather believe that he willingly sacrificed some trifle in the size of his picture, to the production of the exquisitely artistic effect here exhibited. The general feeling pervading these photographs is very similar to that which characterises Mr. Mudd's, to which they are only second. Great taste has been displayed in the selection of the views, and the delicate tender mode of treatment does entire justice to the views selected; full of gradation and half-tone, they are at the same time brilliant and forcible pictures.

A series of large and vigorous photographs from the Elgin Marbles, executed by Caldesi, Blandford, and Co., afford a satisfactory illustration of the value of photography in an educational point of view. No drawings made by the hand of man could possibly possess a tithe of the truth and value, to the student without access to the originals, which belongs to these photographs. Of equal merit, and even more of picturesque value, inasmuch as they render perfect subjects rather than fragments, are the large photographs of "The Seasons," executed from Thorwalsden's bas-reliefs, and exhibited by the London Stereoscopic Company.

Those of the visitors to this exhibition who saw Mr. Hickes' picture of "The Post-office; One Minute to Six o'clock," shown at the last Exhibition of the Royal Academy, will be delighted with the photographic copy by Messrs. Cundall and Downes. Notwithstanding the difficulties presented to the photographer by the amount of brilliant colour in the original picture, much of the vigour and life of the painting is preserved. Perhaps the most interesting picture amongst the class of reproductions is Doviziclli's photograph of Guido's Aurora, which is on a very large scale, and exquisite in its truthful rendering of the original painting. Much as we are indisposed to admit the conclusions of the critic of *The Times* on many subjects connected with photography, we cannot forbear quoting his remarks on this subject, "How inexpressibly inferior to the photograph is the best of the many engravings of Guido's masterpiece! And yet it has been fortunate in its engravers. But take the best in that sort, and we maintain that the best imitation which the burin of even a Strange, an Anderloni, or Longhi can produce, would be poor and dead to such a version as this of the great work of the Rospigliosi Palace. We say this with profound conviction, not unaware of the charges of heresy that such a profession of faith may expose us to from certain schools of connoisseurship. But were we sure that photographs of pictures would last, we are not sure that we should not be content to see engraving numbered among the extinct arts." This much from a critic who has felt it necessary at the outset to guard himself very carefully from being supposed to recognise photography as a fine art, and has expressed his profound satisfaction that "the domain where photography ends should be so sharply and certainly fenced off as it is from where art begins," is gratifying homage to the power of our art. With all our warm love for, and faith in, photography, we should have hesitated to express such an opinion as is thus uncompromisingly uttered, if not by an antagonistic critic, yet by one, whom we, as photographers, would regard as at least an "outsider."

A further examination of some of Mr. Fenton's pictures is more satisfactory than the first. In the series of photographs of Furness Abbey he has been very happy. No. 22, "The Nave, from the East," is a magnificent picture, and quite stereoscopic in its relief and vigour, whilst the effect of light and shadow is very beautiful. One very peculiar effect of the lowness of tone, of which we last week complained as pervading Mr. Fenton's photographs, is the twilight effect which seems to pervade the landscapes: almost every picture suggests the idea that it was taken just at the commencement of the "gloaming." The effect aimed at is manifestly that of softness, and the rendering of detail in all the lights and perfect drawing in all the shadows; but the fact is, that in many of the pictures there are absolutely no lights at all, and the observer is tantalized by desire to seize a pencil and touch in a few vigorous lights to give brilliancy and life to the picture. In many of the prints there is also sufficient want of transparency in the shadows, to indicate that the negative was just verging on fogging; and suggest that a very new collodion in its highest state of sensitiveness was used, and excited in a neutral bath, when everything was in a state of trembling equilibrium between perfect results and absolute fogging. Mr. Fenton's productions have so long been regarded as standards of excellence amongst photographers, that whilst fully recognising all their real beauties, we feel the more imperatively called upon to point out their faults, which might find imitators. No. 143, "The Terrace, &c., Harewood," is one of the worst pictures Mr. Fenton exhibits, both as regards point of view, which produces an offensive series of parallel lines, one above another, without much apparent recession, and for the faults of treatment we have described

Closely allied in many of the characteristics to the photographs of Mr. Fenton this year are those of Mr. Lyndon Smith. Last year some of the photographs exhibited by this gentleman we regarded as amongst the finest shown, especially in the rare, soft, poetic rendering of atmospheric effects. We fear there is a slight tendency to carry this power to excess, and to let it become a mere *manner* which supersedes other beauties. We should regret this, as we regard Mr. Smith as one of our most artistic amateurs. No. 1, "A Glimpse of the Wye through the Yew Trees," may, on inspection possess many merits; but being as it is, high above the line, above the door in fact, and far from the light, it appears a sad unsatisfactory affair, and unworthy of Mr. Smith.

Bisson Freres contribute some good photographs of Alpine scenery, possessing great detail, vigour, and breadth. No. 35, "Vallée de Chamounix," and No. 47, "Savoie Pyramide de l' Imperatrice," are fine examples of their peculiar style.

Foremost amongst pictures possessing the second degree of merit, if not, indeed, quite amongst the first, are the photographs of Mr. Samuel Bourne. These are by the Fothergill process, and help to strengthen the position we have often stated, and pointed out last week as strikingly illustrated in this Exhibition—namely, that it is not in process that excellence depends. There is, as we stated, Mudd representing the collodio-albumen; Maxwell Lyte the metagelatine, Bedford, Heath, and a host of others, the wet collodion process, and here is Bourne representing the Fothergill process, all achieving the highest excellence.

Mr. J. Dixon Piper puts in a most excellent appearance at this Exhibition. His picture No. 121, "Lock Gates near Ipswich," is very fine both as a picture and a photograph. A "Study of Foliage," No. 155, is well chosen and beautifully rendered. An invaluable study for a painter. The same remarks are true of No. 251, "A Lane Scene."

Mr. F. C. Earl's "Panorama of Raglan Castle," No, 279, is a picture which has received, and is worthy of, much admiration. A large picture very perfectly photographed, and possessing many beauties, it is nevertheless somewhat marred in our eyes by the point of view, which presents an angle of the tower as a straight line right down the middle of picture, almost cutting it in two. The actual joinings—the picture being in three pieces—are most skillfully and judiciously managed.

Two "Views in Warwickshire," Nos. 175 and 176, by Mr. Josiah Spode, are well worth notice, they are brilliant and vigorous, but free from hardness. Major Gordon sends some excellent photographs from the Isle of Wight, warm in tone and perfect in manipulation, but unfortunately possessing white skies. Mr. Cruttenden's contributions to the Exhibition are amongst the best, and full of interest, we may especially call attention to No. 273, "Kit Cotty Stones," near Maidstone, Mr. T. Gillis's Vallée d' Argelez, with St. Savin in the foreground, is a very fine picture. "Fur and Feather," No. 437, an exquisite study of still life, exhibited by Mr. A. H. Talmadge, will receive much admiration. Mr. J. H. Morgan contributes a number of very excellent photographs, which we shall notice more in detail in another article, as also the fine pictures by the waxed paper, and collodion processes, by the Rev. T. M. Raven. "A Frame of Studies," No. 534, by Mrs. Verschoyle, are worthy of attention, not simply because they are the productions of a lady amateur, but for their own intrinsic excellence.

ERRATA.—In our last week's notice of the Exhibition a somewhat curious literal error occurred. In speaking of Mr. Fenton's pictures we wrote, "there is, perhaps, in some of these a slight tendency to a uniform lowness of tone and want of vigour." The printers substitued for "lowness of tone," "looseness of tone." A facetious friend has remarked that he thought it was a new-coined phrase in critical terminology, intended to indicate the opposite of "fastness of colour," and meant that the tones were not permanent.

We may also here state that we are informed by Mr. Robinson that the price quoted in the catalogue for his "Holiday in the Wood" is an error: 22s. is a misprint for £2 2s. It is amazingly cheap at that sum.

Scientific Gossip.

THE results of some very interesting researches have recently been communicated to the scientific world by Professor Bond, having for their object the examination of the light of the moon and the planet Jupiter, and embodying the results of photographic and optical experiments on the light which these heavenly bodies transmit to the earth. These two bodies, being each illuminated by the sun, might be supposed, at first thought, to reflect the visible and chemical rays to the earth in just the same ratio. This is, however, found not to be the case, the rays from Jupiter having been discovered to possess a remarkable degree of chemical energy, compared with those reflected from an ordinary opaque substance on the earth, and from the moon; similar excess exists in the optical brightness of this planet. The chemical *albedo* of Jupiter, supposing the planet to reflect light after the usual manner of opaque substances, exceeds that of the moon in the proportion of fourteen to one; the optical in the proportion of eleven or twelve to one. These experiments are open to the large uncertanties to which photometric comparisons are ordinarly liable; but assuming their correctness, and that as there is good reason to suppose the proportion of sunlight evident on the moon which is absorbed at its surface, compared with the amount reflected, is less than the smallest of the above-named ratios, it would follow that the planet shines in part by native light, agreeably to the old notion of phosphorescence. It is difficult to put any other construction upon the experiments, provided that Lambert's theory of the quantity of sunlight reflected to the earth from a planet is applicable in the case of Jupiter. Perhaps a more acceptable explanation is to suppose that its surface has the property of returning towards the sun a disproportionate amount of the whole quantity reflected, taking ordinary opaque substances as a standard. That this condition obtains with the moon may be inferred from the fact that at the full, the margin of its disc is brighter than the central regions, indicating a peculiarity in the constitution of its surface, which would be likely to produce an excess of brightness at full moon. It is, moreover, placed beyond question, from a consideration of the observed variations of the illuminating power of the different phases of the moon (of which a detailed account is given in the complete memoir of Professor Bond), showing that the theoretical representations of the intensity of moonlight in its changes from new to full, and *vice versâ*, as investigated by Euler and Lambert, bear no resemblance to the actual variations in the amounts transmitted to us. As Jupiter always presents a nearly full phase to the earth, a similar property of reflection in its surface would tend to explain the anomaly. There is, however, this objection to that hypothesis: while the superior marginal brightness of the full moon, whatever may be its cause, would naturally lead us to anticipate just that deviation from Lambert's theory of the amount of illumination derived from it which is actually observed to occur; the reverse order in the distribution of light over the disc of Jupiter, namely, its regular increase from the margin to the centre, in very good accordance with the same theory, is a strong argument for considering the latter as properly applicable to the planet; in which case the explanation suggested would no longer be admissible.

Photographers spend so much of their time in rooms which have to be illuminated by artificial light, that they will feel especially interested to learn that by some recent improvements there is a strong probability of relief from those impurities which render illumination by gas so prejudicial except in well ventilated apartments. A paper by the Rev. W. R. Bowditch, read before the Royal Society, describes a series of experiments upon which he has been engaged for the purpose of removing sulphuretted compounds from coal gas. Hitherto the bisulphide of carbon has resisted all attempts to remove it, and scientific men have been forced to confess themselves baffled in their experiments, but Mr. Bowditch has now found that by passing gas containing this deleterious ingredient over dry slacked lime heated to a moderate temperature, the sulphur is evolved in the form of sulphuretted hydrogen, having left the carbon, and being now in a state easily removable by many well-known and commonly practised methods of purification. In a former "gossip" we gave an account of some researches of Hoffmann, in which he had discovered a very delicate test for bisulphide of carbon, and we there stated how injurious this body was in illuminating gas; we are glad to be able now to state that, as soon as the above-named purifying process shall be generally adopted by the large gas companies, most of the serious objections which have been entertained to the introduction of gas in exhibitions, picture galleries, libraries, and private houses will be removed.

At the last meeting of the Manchester Literary and Philosophical Society, an interesting observation of Professor Arnaudon, of Turin, was mentioned, to the effect that oxalate of ammonia completely modifies the action of yellow prussiate of potash, when used in solution with a salt of peroxide of iron. Thus if oxalate of ammonia be added to this metallic salt, it will give no prussian blue when a solution of yellow prussiate of potash is added; but on the addition of an acid, prussian blue is immediately produced. The knowledge of this fact will be of interest to photographers, as these agents, both singly and combined, have been frequently proposed to be employed in various printing processes.

At the time of the occurrence of the eclipse of the sun in July last, we mentioned a series of photographs which had been taken of the progress of that phenomenon by

Messrs. Spiller and Crookes. We had recently an opportunity of seeing the complete series, which, appropriately mounted, formed one of the most attractive features in the library of the Royal Institution, on the occasion of the opening meeting of the season on Friday last. The complete series of photographs was mounted in one line, and was so arranged with the description, that it conveyed to the eye of the observer a complete panoramic representation of the passage of the moon across the solar disc. The frame likewise contained a series of photographs of the 1858 annular eclipse, and some of the unobscured solar disc, showing a gigantic spot in a very striking manner.

Another patent involving the employment of a bichromate! Mr. G. Wallis patents new or improved methods of preparing photographs, &c., for the purpose of engraving the same on metal plates, and thereby producing printing, embossing, or ornamental metallic surfaces. The patentee claims first the method, or methods described of preparing photographs, for the purpose of impressing or engraving the same, in or upon metallic surfaces, to produce printing, or embossing surfaces, by the use of mixtures, or compositions, consisting essentially of purely pulverised hard granular substances, and softer bodies of mineral, or vegetable origin, mixed with some glutinous body, such as gum aribic; which mixtures constitute drawing materials, which will flow easily from a pen or brush, and which, when dry, will form a substance sufficiently hard to impress metallic plates when subjected to strong pressure thereon. Secondly, the use of bichromate of ammonia, or other soluble chromic salt, as a fixing constituent in mixtures, or compositions, to be used for preparing photographic pictures, to be afterwards impressed, or engraved upon metal surfaces as described. Thirdly, the production of a tint upon a metal surface, when impressed with paper or other material, upon which the photograph has been made, and the treatment therewith with scraper and burnisher in the manner of a mezzo-tint engraving, for the production of effects of light and shade, when printed from in the manner of a copper-plate. Fourthly, the method of redamping photographs which have been previously treated, as before described, for the purpose of supplementing the same with granular powders. Fifthly, the general arrangements or combination of parts of the machinery described.

The above brief abstract will serve to give our readers a sufficient idea of what the inventor proposes to effect. We confess we have little expectation of the patent ever becoming of much practical value.

THE LIME LIGHT.

ITS APPLICATION TO PHOTOGRAPHY.

ANY experiments with the lime light for photographic purposes must have interest with the readers of the PHOTOGRAPHIC NEWS, I now propose, therefore, to lay before them a few hints derived from my own practice in this direction.

The lamp and apparatus I have used is one which is patented by Mr. Prosser, and is of a similar character to that employed by Dr. Pepper at the Crystal Palace. The lime is enclosed in a metal case, which is kept moving within a second metal case either by clockwork or other means, thus maintaining an equal focus and amount of light thoughout the experiment.

It is found that although the light is produced with great effect when carburetted hydrogen or the common coal gas of the streets is used in combination with the oxygen, still this illuminating power does not contain the necessary freedom from colour, that is at all times essential to a good photographic result.

The light so produced is nevertheless capable of being used for photographic purposes, provided its rays are concentrated by means of a powerful lens. The one I have used in some of my experiments is what is called a "lamp lens," being in fact the ordinary plano-convex or condensing lens of the magic lantern. This kind of lens has however the disadvantage of destroying in a great measure the chemical or actinic property of the light either by absorption or otherwise.

It is much better to use one made of pressed glass, called a parabolic lens, and known as Degrand's patent pressed lens; the quantity of glass through which the rays of light have to pass is thus reduced from about 6 inches to half an inch, the value of which reduction is obviously considerable.

But to return to the lime light, I may state when using the coal gas as one of the combined gases and not using a lens, I have invariably perceived the existence of colour to a slight extent, but this is less apparent when the rays are concentrated by the lens. In the first instance five minutes will not produce a picture, in the second instance five seconds will produce one; but in the latter case I have had everything in the same condition as if I were taking instantaneous pictures by daylight.

It is an easy matter to arrange the camera and lamp for portraiture, and to use lens, or reflector, or both; the latter method reduces the exposure, but it is considerably more objectionable to the sitter.

It is also an easy matter to copy by means of the camera, when the condensing lens is used with the lime light; I have taken pictures by this means with the same exposure I should have given to a picture in diffused daylight, viz., two minutes; but this must of course depend upon the distance the light is from the object, and the colour and nature of such object; the aperture of the jet; the pressure on the gas bags; the purity of the gases; and the colour of the paper on the walls of the room; the result is affected in a greater or less degree by all these matters.

Pure hydrogen and pure oxygen should be used in the proper proportions, this is instantly ascertained by the light given out; should either gas be in excess the effect is apparent to the operator. These quantities are regulated by the stopcocks for that purpose.

The light being free from all colour, the lens and reflector may for portraiture be dispensed with, but in copying by means of the camera they may still be used to save time. The copying lens will not be found to bear much stopping down unless the light is powerful and pure; a few trials will soon convince the operator of the right course to pursue.

Printing by superposition is also to be accomplished by means of the lime light; Mr. Malone, in a recent paper has stated that the electric light will print a picture in this way in fifteen minutes. It is a more intense and actinic light than the lime light, but at the same time it is thirty times its cost, and has neither the volume or the steadiness and continuity of the lime light. The power of the latter, unassisted by lens or reflector, for this kind of printing, and when at some little distance from the prints, is equal, if not superior, to that of diffused daylight; but when the picture is brought near to the light, or a condensed ray is thrown upon it, it has almost equal effect to moderately powerful sunshine. It is worthy of remark, however, that the rays of light emanating from the incandescent lime, and as I have previously stated, unassisted by lens or reflector, are not of that diffusive character as to give a weak picture, although the time may be prolonged in which it is obtained, the resulting proof will in the end equal that obtained in the strongest sunlight, provided the negative is not too opaque, or that the light is not too weak, from any of the causes I have enumerated.

As regards the adaptation of the lime light to the solar camera, it must be obvious that if a picture can be copied in five seconds the light having to pass through a condensing lens and afterwards through a portrait combination, it can be enlarged or copied upon an enlarged scale by means of the solar camera with these lenses. The only difference in the arrangement being, that in the solar camera the rays of light would pass (so to speak) direct upon the sensitive plate or paper, and in the ordinary copying camera the process would be effected by reflexion.

The advantage therefore must be with the solar camera.

By using the paper prepared as recommended by Mr. Sutton, for use with the solar camera,* and proceeding by development, the exposure would, with a powerful lime light and proper apparatus, be about six minutes.

All this may be done provided the essentials are correct and in order, but should one of them be wanting, no dependence can be placed upon the results, either as regards the length of exposure, or the quality of the picture.

The lime light is one of the most valuable friends a photographer can have, and nothing can be more simple than its management, provided ordinary care is bestowed upon it. S. S. B.

PREPARATION AND ANALYSIS OF THE IODIDES.

BY M. A. GAUDIN.

IODIDE of silver is the very soul of photography. Up to the present time, every process for obtaining images (negatives) has been based upon the employment of iodide of silver.

The first indication of the visible modification of the compounds of silver by light were made, it is true, before the iodide was discovered; chloride of silver, which is so often produced when operating with salts of silver, rapidly changes its pure white colour for a slaty hue under the influence of the diffused light of the laboratory. This chloride was regarded for a long time as the body most sensitive to light. After the discovery of bromine, a similar remark was made upon bromide of silver; while iodine, which had preceded bromine, did not appear to produce an iodide of silver so sensitive to light.

It was on this account, generally, that the attempts to produce images by light revolved continually around the employment of chloride or bromide of silver. Five or six years prior to the publication of the discoveries of Niepce and Daguerre, I was engaged in obtaining images by light, and I did not omit to make use of chloride of silver precipitated on paper; but my operations were limited to the production of silhouettes of the wings of insects by means of the direct light of the sun, and I could only preserve the pictures by sheltering them under red glass.

Upon the announcement of the photographic discoveries of Niepce and Daguerre, but before the publication of their processes, knowing only that they operated upon silver, I also made use of chlorine, but without any apparent success.

Niepce, who produced his pictures by means of bitumen, modified by light, at first employed iodide only to blacken the silver, in order to bring out his heliographs, which were visible only by reflection, as in Daguerre's process; and doubtless a plate left to itself with any object placed on its surface, will show the imprint of that object, after a prolonged action of diffused light; for, as all who have practised the Daguerreotype process well know, an iodized plate, which, in the first moments of luminous action, does not at first appear to change its colour, subsequently assumes every imaginable hue.

Whatever it be, the Daguerreotype process is based essentially upon the employment of iodide of silver, notwithstanding the increased sensibility it receives from the addition of bromine and chlorine. The collodion, albumen, and paper processes have also iodide of silver for their principal basis.

I am astonished to find that many persons maintain that this is due to a mathematical cause. I have on a former occasion shown, when speaking of certain properties of light, that the distinction of colours, which is generally perfectly defined, depend, nevertheless, upon the comparison of two sensations, differing from each other in time and length, by a quantity unimaginable by its minuteness.

In the present case the cause is evident, the fact is before our eyes. If, for instance, we enquire which of the simple metallic bodies possesses the greatest atomic weight, we find that it is silver; if we next enquire which mineralizer possesses the greatest equivalent, we find that it is iodine; if, lastly, we enquire what binary compound of the simplest composition which possesses the greatest atomic weight, we shall have for a reply—iodide of silver.

The atom of silver weighs	... ...	108
The equivolent of iodine	... ...	127
Hence the equivalent of iodide of silver is		235

The other precious metals, the oxides of which are easily reducible, such as gold, platinum, iridium, asmium, mercury, lead, and especially bismuth, have a very high atomic weight, while the difficultly reducible metals, such as calcium, magnesium, sodium, &c., have a very low atomic weight. These examples suffice to prove the reality of this cause, for notwithstanding apparent exceptions, a profound examination will show that in general affinities are much more energetic, and consequently, the resistance to decomposition by light is much greater when the atomic weight of the combined bodies is the least; and for the same reason, also with light atoms, the alteration by light is also manifested upon the very heavy molecules, on account of the greater number of atoms of which they are composed. The composition of iodide of silver is of the simplest, but the atoms of which it is composed are very heavy; so that in order to arrive at as great a sensibility with compounds, formed of light atoms, would require a very complex formula, such as is presented generally by resins and analagous bodies.

The first employment of iodide of silver in photography occurred in a very simple manner, in Daguerre's process it is polished silver which is submitted to the vapour of iodine. The silver itself, by a process previously brought to perfection, was fixed upon the copper, in layers as pure and homogenous as could be desired; it is a metal which very readily receives a polish, and iodine is the most suitable substance to produce a vapour which shall increase with the temperature; so that the sensitive layer of iodide of silver is readily produced by exposing the polished silver plate in a box containing a few grains of iodine covered with cotton.

The combination is easily effected by this arrangement; the silver becomes covered with a golden yellow film, composed simply of iodide of silver, of an extreme tenuity, almost refusing to be analysed, and organised in a manner that science cannot define: on account of the phenomena of cementation, necessarily produced, the silver and the iodine, being each in excess, the iodide of silver is poorer in iodine where in contact with the silver; this constitution, which produces a certain molecular tension, also facilitates its decomposition by light, the principal effect of which is to invest the composition of the iodide of silver. After the action of the light the iodide of silver is poorer in iodine on its external surface, which previously was the richest in iodine.

(To be continued.)

PHOTOGRAPHY AS A FINE ART.

THOSE who deny to Photography the right to be ranked among the Fine Arts may be surprised to learn that it requires a greater variety of talent, and that of a high order, to produce a good photographic picture, than it does to cover a square yard of canvass with a picture eligible as an Art-Union prize. The manipulations of the painter are few and comparatively easy of acquirement. Crayons, pencils, and pigments, handled with perseverance and taste, soon enable the painter to produce a result which shall astonish the vulgar. But the photographer, to succeed in his vocation, must make himself familiar with chemical phenomena and optical laws, and superadd to these (usually regarded as the only needful guides), a knowledge of those principles of art which the painter arrogates solely to himself. The photographer must not only study and master the principles of chiaroscuro, but he

* We will give the formula in an early number

must also be able to control the chemical agencies by which he obtains his results, so as to ensure the end proposed. The difficulties that beset the photographer in this direction are almost incredible; and so far from this new art being regarded as a mechanical one because the picture is drawn by Nature's own finger, acting through a mechanical agent. the result will depend, for its artistic excellence, entirely on the knowledge and taste of him who directs the lens to the object represented. This fact is strikingly shown in pictures of the same inanimate object taken by different photographers: it is easy to pronounce, at first sight, whether a view of Ben Lomond has been taken by Fenton or Heath, by Bedford or Llewellyn; for, like the painter, the photographer has his *manner*, and this manner is the exponent of his judgment, taste, and feeling. His judgment is shown in the selection of that hour of the day at which the object exhibits the best play of light and shade, the most perfect chiaroscuro; his taste will display itself in the selection of the best point of view, so that all harshness of outline be avoided, and unfavourable accessories omitted; his feeling will will be exhibited in the choice of the subject itself. One revels in moss-clad ruins; another in bosky dells; others in the misty morning landscape, or the wave-beaten sea-shore.

But it is in portraiture that the supreme difficulties and triumphs of the photographer are encountered. In this sphere of his art we look in vain for the Titians, the Rembrandts, the Vandycks, or the Gainsboroughs. Occasionally we meet with photographic portraits that remind us of these masters of the "human face divine;" but it would seem, from their rarity, that they must be the result of accident rather than of design. And this deficiency is no reproach even to the artist-photographer; for he may prepare his chemicals with the most scrupulous care, plant his camera on the chosen spot, pose his model with consummate skill and taste so as to obtain a Rembrandtist effect of chiaroscuro, yet the resulting picture may both astonish and disgust him. All his skill, care. and taste are baffled by a subtle and unfamiliar agent—the chemical action of light—which refuses to do his bidding, which will translate his conception neither literally nor poetically, but after a fashion and a method of its own. This obstacle to successful results is greater than any the painter encounters, except lack of genius, and it requires more patience and skill to overcome, than to master all the arcana of "high art." The photographer, like the engraver, produces his effects by light and shade; he owes nothing to colour; and being deprived of this latter attractive element—which covers so many defects in painting—his chiaroscuro need be the more perfect. It is but too evident, from the abundance of bad photographic portaits, and the extreme rarity of those that are truly excellent, that this great obstacle to success is seldom overcome; nor, seeing the rare combination of talent that must unite to form the perfect photographer, can we hope to see it overcome to any extent. Many eminent continental artists have become photographers; early familiarity with chemistry has enabled them quickly to overcome the mechanical element of the art; their art-culture has supplied the rest. Productions of artists of this class are prized as highly, in comparison, as the choicest easel productions of contemporary portrait-painters; and deservedly so, inasmuch as they contain an element of truth beyond the reach of the pencil, by whomsoever handled.

The sphere and power of photography have been greatly misunderstood. Like every art it has its boundaries, within whose limits it may become unrivalled, without encroaching upon the domain of other arts. It cannot rival painting as it is deficient in the attractions of colour. Yet this latter element is the one that can be easiest dispensed with in a work of art. In the presence of the cartoons of Kaulbach, or of the "Dying Gladiator," we are conscious of no loss of expression arising from the absence of colour. Rembrandt made no sacrifices to colour in his magical preductions, but impressed the mind of the beholder through the influence of his masterly chiaroscuro. In the truthful rendering of chiaroscuro lies the magic power of photography: it translates the marvellous play of Nature's light and colour into a sober page of black and white, which the eye can reclothe in its pristine hues. The absence of colour in photography is, in fact, no loss but a gain, for it leaves the eye undisturbed in its contemplation of form and chiaroscuro. It possesses the high merit of affording a means of educating the eye to a just appreciation of outline and form. And it came very opportunely to this end; for the public taste, vitiated by the gaudy productions of a large class of mediocre painters, who had run riot in colouring, needed some truthful guide to restore to it its pristine power of discrimination. The glowing prismatic hues of the puny imitators of Turner dazzled the eye and cheated the judgment of both critic and public, and had not the colour-fever been checked by the advent of photography, the time would not have been very far distant when the British artist would have become incapable of drawing a hand or a foot with tolerable accuracy.

The art that photography most resembles is engraving. In both the object is represented by form and chiaroscuro. But photography is limited in its range. It can only represent actualities, it cannot create subjects. As the hand of man can neither change nor modify the photographic image, the art sinks below other arts which can embody man's creative power. The sculptor can create his Appollo or Hercules—photography cannot create such subjects, but only represent those that are created by the effort of man's genius. While photography is superior to engraving in its power of faithful delineation. it is inferior to it from the absence of creative power, for the engraver is not limited to the delineation of existing objects, but uses his burin as a crayon, and with it exercises his creative faculty.

But inasmuch as photographic results are governed or modified by the artistic culture of those by whom they are produced, we must admit photography into the category of fine arts. When its processes become more manageable, as much so, in fact, as the crayon in the hands of the painter, then will photography approach still nearer to a high place among the fine arts; for, inasmuch as being less dependent on manipulation, there will be the more room for the exercise and display of the artistic faculty. Every year brings us nearer to this desired consummation.

We watch, year by year, the development of the artistic element in photography in the Society's exhibitions. This year there are evident signs of progress. There are few very bad pictures, while the average is far above mediocrity. In landscapes, the productions of Fenton, Bedford, Heath, Mudd, Piper, Raven, Lyte, and some others, are noteworthy for a genuine appreciation of the artistic capabilities of their subjects. In portraiture the coloured specimens are greatly in the majority, and the pictures of Carrick, Claudet, Lock, Whitfield, Gust, and Ferguson arrest the attention of admiring crowds. Two large views in Rome—the Colosseum and the Church of St. Peter—the work of P. Dovizielli, are marvels of art. There is the usual quantum of contributions from amateurs, neither remarkable for excellence, nor particularly interesting for their subjects. We miss many names of those who have powerfully contributed to render the art as excellent as it has now become. and we may justly deplore the extremely narrow limits within which this wonderful art continues to be exercised. There is abundant display of dilettantism, but little of genuine connoisseurship. With the boundless wealth in art possessed by this country we ought to have been made much more familiar by the aid of photography than we now are. Looking at the unlimited resources of photography, we must confess ourselves disappointed at the poverty of this year's exhibition.—*The London Review.*

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held on the evening of the 17th inst., the Rev. F. F. STATHAM, B.A., F.G.S., occupied the chair.

The minutes of the former meeting having been read and confirmed, the secretary read a letter from Mr. Bailey, of Darlington, one of the society's provincial members, describing the specimens from waxed-paper negatives he had forwarded to the society's portfolio, and presented at the last meeting. One was by the Rev. T. M. Raven, and the others by Mr. Hooper of Manchester. Another letter was read from Mr. Bolton, wood engraver, enclosing a copy of a communication to the PHOTOGRAPHIC NEWS, explaining that the engravings from Flaxman's bas-reliefs, appearing in the recently published *Lyra Germanica*, were photographed on wood and engraved by him. The secretary also announced the gift to the society's library by G. Wharton Simpson, of a copy of "The Photographic Teacher," "The Principles and Practice of Harmonious Colouring applied to Photographs," and "The Photographic News Almanac."

The following new members were proposed and elected during the evening—Messrs. Foxlee, J. Warner, J. H. Symons, Sydney Smyth, and James Contenci; the latter gentleman presented some specimens of a process of photo-lithography, on which he was engaged in experimenting, and which, though as yet imperfect, had many features of promise.

T. BURR, Esq., F.R.A.S., then proceeded to give an eloquent and highly interesting account of the history of photography in connection with the sciences of astronomy, meteorology, and magnetism. After explaining that his presence amongst them was due to the urgent invitation of his friend Mr. Wall, he proceeded to glance at the earliest applications of photography to astronomy. The first publicly exhibited specimen was a Daguerreotype of the full moon, which was taken at the observatory, at Cambridge, Massachusetts, U.S., and exhibited at the Great Exhibition of 1851. It was taken by a refracting telescope of fifteen inches aperture, perhaps the finest in the world, the gentlemen who produced the picture were Messrs. Boud, Whipple, and Black. In the year 1851 the collodion process was introduced by Mr. Archer, and in 1852 Mr. Warren de la Rue made some attempts to photograph the moon on collodion plates, and produced a positive an inch and a half in diameter, which was shown at the meeting of the Astronomical Society in 1853. At that period he had no driving machinery to enable the telescope to follow the moon's apparent motion, he was obliged to have recourse to the assistance of some one to assist him in making the telescope do this, and Mr. Thornthwaite afforded him valuable aid. The difficulties were, however, so great, that Mr. De la Rue gave up the experiments until he was able to apply driving machinery to the telescope. In the year 1853 Professor Phillips applied photography as a means of getting pictures of the moon, using a telescope of six inches aperture. In 1854 some pictures were taken at Liverpool, by Mr. Hartnup, Mr. Crookes, and some other gentlemen, using a refracting telescope of eight inches aperture. Father Secchi, at Rome, with a telescope of nine inches aperture, produced pictures of the moon, and subsequently Mr. Fry, at Brighton, and Mr. Huggins at Tulse Hill, had commenced their operations. Mr. Burr then proceeded to explain the difficulties which beset the operator when using a refracting telescope, on account of the variation of the chemical and visual foci, the actinic focus generally falling beyond the visual to various extents, in the telescope of Mr. Huggins, to the extent of three-fourths of an inch. In the reflecting telescope this difficulty was obviated, and the operation of focussing was easy enough. In 1857 Professor Boud turned his attention to the collodion process, and sent over to this country some pictures of a fixed star and its companions. One great advantage of this achievement, was the fact that careful and actual measurement could be applied so as to ascertain their distances, positions, &c., with much more accuracy than could be done by the usual process with a micrometer. Professor Bond also sent over a picture of a fixed star passing over his transit telescope, exhibiting a distinct line of light passing across. It was blurred and irregular, owing to varying atmospheric conditions. In 1851 he obtained some Daguerreotypes of double stars. Mr. Burr then proceeded to a brief detail of the operations of Mr. Warren De la Rue, and his method of applying clockwork to cause the telescope to follow the orbital course of the heavenly bodies, and also his general method of working. In the course of these remarks he observed that Mr. De la Rue had not found that loss of actinic power from employing a second reflection that his knowledge of the loss of luminous power had made him anticipate. The negatives of the moon produced by different experimentalists varied in size, depending upon the powers of the telescope used. Some were as small as a fourpenny piece: others were as much as three inches in diameter; whatever the original size, they could of course be produced of any dimensions required by a subsequent process of enlargement. The phenomenon of libration, and the facilities it afforded of obtaining stereoscopic pictures of the moon, was next explained with much lucidity. Some interesting details regarding photographs of the stars followed, in the course of which it was stated that Jupiter was considerably more actinic than the moon, although much darker in appearance so far as colour was concerned, whilst Saturn was much feebler in actinic influence. Some details of Mr. De la Rue's experience in photographing the sun, and the use of the photo-heliograph were then given, and a few particulars of the only photograph of Donati's comet followed. This was taken by Mr. Underwood with a common portrait lens in seven seconds.

Mr. Burr then proceeded to give an interesting resumé of the various applications of photography to magnetic and meteorological registration. After pointing out the importance of a correct and reliable system of magnetic registration, and the impossibility of using mechanical appliances to perfect a system of self-registration, he proceeded to describe the beautiful contrivance which had been finally adopted to secure a photographic self-registration of every vibration of the magnet. It is somewhat difficult to do justice to the description without the diagrams; but we may briefly state the principle upon which the apparatus works. Attached to the suspended magnetic bar, the oscillations and declinations of which are to be registered, is a small mirror which reflects the flame from a lamp of napthalised gas, placed at a suitable angle. Every reflection or vibration of the magnet causes, of course, a similar vibration of the mirror attached to it, and every vibration of the mirror alters the angle of reflection of the light from the lamp. It will be readily seen that the vibrating ray of light reflected, if thrown on a screen, would describe a series of zigzag lines, the indentations being in proportion to the distance of the screen, or the length of lever which the ray of light formed. Instead of a screen, however, this reflected ray is received on a sheet of sensitive paper, rolled round a glass cylinder, and which, to bring a fresh surface constantly under the point of this pencil of light, is made to revolve at a uniform rate by means of its connection with a chronometer. Every twenty-four hours the sensitive sheet on which this ray of light has traced the magnet's deflections is taken out and developed. From it a negative is copied, and then the number can, of course, be multiplied at will. Mr. Burr's lucid explanations, which we have barely indicated, were illustrated by diagrams, models, and specimens of various kinds, which materially added to their general interest. Fuller details on the absorbing subject of which they treat maybe found in the various papers on celestial photography, by Mr. Warren De la Rue, in our last volume, and in Mr. Glaisher's papers on "The Application of Photography to Investigations in Terrestial Magnetism and Meteorology," at pp. 45 and 138 of the second volume of PHOTOGRAPHIC NEWS.

The CHAIRMAN, in proposing a vote of thanks to Mr. Burr, expressed his regret that his address had not been in a written form, so that they might have hoped to have seen it again in its entirety. Photography seemed to have grasped the whole subject, and solved almost every conceivable problem, astronomical and meteorological. He thought there ought to be a special grant from Government to support a photographic staff at the Royal Observatory, so that such observations and records should not be left simply to the British Association.

Mr. JABEZ HUGHES thought if any one thing was more than another calculated to elevate the mind and make them enamoured of the lofty capabilities of their art, it was the influence of such eloquent and well-timed observations as they had heard from Mr. Burr. With what a strange and deeply reverential feeling must they all gaze on those mystic marks on the sheets of paper which had been passed round, and which were the self registered tracings of the magnetic deviations. They were in the habit of speaking in vague and general terms of a "pencil of light," of "the pencil of Nature:" here they had its actual embodiment, Nature recording her own operations, tracing her own eternal laws with her own pencil. There was also something strangely interesting in learning the fact, that actinism accompanied light in almost all its forms, and that the light from far distant heavenly bodies formed no exception to that law. That in some respects the laws of the universe, as relating to far off systems, were the same as that of the solar system, we had reason to believe; we knew they were subject to the same laws of gravitation. We saw they had similar light as regards illumination; but it was not until photography had revealed it that we knew that their light was essentially the same as ours, and that the light from the distant stars possessed actinic properties in common with our own. Referring to the first exhibited pictures of the moon, Mr. Hughes observed that there was something interesting in the fact, that the Daguerreotype process, just about to expire, seemed determined before doing so, to inaugurate the era of celestial photography, and contribute its especial offering in that form to that wonderful monument of the world's civilization—the Great Exhibition of 1851. The moon had been photographed, indeed, before that. In 1847, Mr. Mayall and himself took some Daguerreotypes of it. It was true they were small, and blurred from motion; but they served to prove the moon's actinism. There was just one remark made by Mr. Burr which demanded some attention, that was as to Mr. Warren De la Rue's experience on the subject of reflection, and his supposition that there was little or no loss of actinic power in a second reflection. That point required further examination Daguerreotypists who had frequently to use a reflector for the purpose of avoiding inversion of position in the sitter, knew well that they had considerable loss of light in using it, and a loss of actinism in just equal ratio. The time required was generally at least one-half longer; if 60 seconds were required by direct light, 90 were required when the reflector was used; and in dull light the ratio was still greater. There was another point to which he would just for a moment refer. It was stated that in the refracting telescope the visual and actinic foci did not coincide, and that this fact caused great difficulty in focussing, because the ratio of variation was constantly changing. Now this latter conclusion he could not admit. The early experimentalists in photography worked entirely with such instruments, and they obtained as good and sharp images as were obtained now. It was only necessary once to ascertain the amount of variation between the luminous and chemical foci, and make the necessary adjustment of the ground-glass and slides of the camera, and there was then no further trouble. M. Claudet had, it was true, at one time propounded a theory asserting this perpetual variation in the relation of the foci; but he did not remember that it had been practically confirmed by any observer. Mr. Fry had stated that in his lunar experiments he had suffered from a similar difficulty; he could not but think, however,—

Mr. Fry explained that Mr. Warren De la Rue had, at the parent society, a few evenings ago, satisfactorily explained his difficulty by suggesting that it was caused by the expansion and contraction of the tube from variation of temperature.

Mr. Hughes could hardly recognise that as meeting the case. Such contraction and expansion might alter the focus, but it would alter the visual as well as the actinic focus; it could not alter the relation of each to the other.

Mr. Burr suggested the varying refracting influence of upwards of forty miles of atmosphere.

Mr. Hughes still must maintain that all the circumstances that would affect the chemical focus, would, so far as optical laws were known, affect in similar ratio the visual focus.

A conversational discussion then arose on this subject, in which Messrs. Burr, Hughes, Fry, and Davis took part. The real source of doubt seemed to arise out of the fact that the various experimentalists had taken note of the varying actinic focus, but had not thought of observing, if, at the same time, the visual focus had altered; its stability having been merely taken for granted from the knowledge that it had been adjusted once correctly, and then not altered by any further adjustment or movement in the instrument.

After a vote of thanks to Mr. Burr, the discussion on the subject was adjourned.

Mr. Fry wished to make a few remarks on the late discussion on composition printing. His object was simply to claim for the photographer the same privileges and licence usually accorded to painters, which would permit them to print-in to their pictures such skies as the laws of composition and good taste should suggest.

Mr. Hughes briefly responded, to the effect that the object desired by both Mr. Fry and himself was the utmost possible excellence in the productions of their common art. They looked at the subject, however, from somewhat different points of view; his own conviction still being that the sole strength of photography lay in its inexorable truth.

The Secretary announced that at the next meeting a paper would be read by their treasurer, Mr. Frank Howard, on "The Successful Practice of the Fothergill Process."

The proceedings then terminated.

Manchester Photographic Society.

The usual meeting was held on the evening of the 9th, Edward Mann, Esq., in the chair.

The chief feature of the evening was the exhibition of some pictures by means of the oxycalcium light, superintended by Mr. Dancer.

Mr. Pyne exhibited some negatives taken by Mr. Sutton, of Jersey, on Dr. Hill Norris's sensitive plates, with an exposure similar to that required in the wet process.

After some announcements, and the usual vote of thanks, the meeting separated.

Birmingham Photographic Society.

The monthly meeting of this society was held on the 18th ult., C. L. Haines, Esq., presiding.

After some routine business, Mr. Rejlander read a paper, or rather delivered orally, on the camera of horrors, or difficulties and failures in the wet process, in which he stated his experience on the various subjects which try the patience and test the skill of the photographer; the bath and the collodion, the glasses and the dust, and above all the varnish, &c. &c.

After some observations by Mr. Osborn,

Dr. Anthony, in expressing his pleasure in listening to Mr. Rejlander, observed that he could not forget the fact that he had done more than any other man in England in rescuing photography from the purely commercial position it had a tendency to assume, and placing it in its rank amongst the arts. Dr. Anthony then made some interesting remarks on his own experiences and operating difficulties whilst in Syria. Regarding the cracking of varnished films, he believed it was generally due to the influence of damp, either in the film at the time of varnishing, or in the atmosphere where the negatives were subsequently kept

After the usual vote of thanks the proceedings terminated.

Photographic Society of Scotland.

The usual meeting was held on the 8th inst., A. G. Herries, jun., Esq., presiding.

After the usual routine process a silver modal was presented to Mr. C. G. H. Kinnear, for his valuable services whilst acting as secretary to the society, and for his invention of the portable camera now well known. After suitable acknowledgments from Mr. Kinnear, a communication was read by Mr. T. B. Johnstone on the malt process, in which he stated that almost everything depended on the preparation of the malt solution. The proportions he preferred were three of malt to twenty of water, which should be heated to about 175° before adding the malt.

Mr. J. T. Taylor read a paper on silver and some of its salts, illustrating the paper with few experiments. No discussion arose.

A letter was read from the Hon. H. Fox Talbot, expressing his regret that he was not able to be present at the meeting. He forwarded a large number of specimens of engravings by the photoglyphic process, which were much admired.

After votes of thanks the meeting separated.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 23rd January, 1861.

An article on "Photography as a Fine Art" in the last number of the *London Review*,* which I have just perused, together with the frequent discourses and discussions on this

* See p. 41.

subject, with which your journal abound, naturally suggest to an observer on this side the channel, the enquiry: how is it that this subject is in so quiescent a state here, and in so active a state of fermentation with you? Not that our quiescence is apathy, but it appears to me that from the first photography being with us in the hands of accomplished artists, it never had to go a begging to be admitted into the category of the fine arts. There is no subject on earth upon which more incoherent nonsense has been written and spoken than upon this subject, art. Yet art has its principles as well as science, which cannot be gainsaid, but for which dreamy wordy dogmatism is usually substituted, to the great bewilderment of the uninitiated, and the intense disgust of the earnest art-student. It is not necessary to enquire whether photography be an art or a manufacture, that will obviously depend upon the culture of the operator; the picture may be the product of the studio, it may also be the product of the workshop. If, as I divine, it has not, if photography has not yet assumed the rank of a fine art with you, it is doubtless due to so few photographers possessing artistic culture. Artists are not made in a day, though operators may; on the contrary, as the poet says,—'Art is long,' long in being acquired, because its sphere is so vast and complicated, that even Titian and Michael Angelo, to the last days of their long existences, thought themselves but apprentices. But sufficient of the principles of art—the laws of light and shade, chiaroscuro, and of colouring—may easily be acquired, which would suffice to guard the operator from the glaring violations of taste so frequently encountered. I am inclined to think that continental photographers enter upon their career with some advantages over those of England, inasmuch as the principles of science form an important feature in their elementary education, while familiarity with the canons of art, exemplified in what we call good taste, is more generally infused into every grade of society. I presume that if Photography were to knock at the door of your Royal Academy, the burly janitor would say, "No admittance," and slam the door in its face. But let not the artist photographer despair; for even the noble art of Engraving was not admitted into that close corporation until nearly a century after it had been established. Here, favoured Photographers rank with Academicians; they are among those whom the Emperor delighteth to honour: for he, with no niggard hand, awards them crosses, and decorates their breasts with a much-coveted bit of ribbon, proclaiming the wearer member of the honoured Legion of Honour. Happy land! happy photographers! They wear no honours but those they have justly earned.

Mr. Roth of Mulhouse, has perfected a process of purification of colza-oil, so as to render it unoxdizable, and suitable for lubricating machinery. This process is by the dry way, the most energetic, rapid, and economical. By heating the oil to a very high temperature, the water and volatile products are driven off; the foreign albuminous and pectinous matters, &c., are dehydrated, coagulated, and speedily undergo decomposition, manifested by the pungent vapours given off. The oil must be heated sufficiently for this alteration to take place, but care must be taken not to raise the temperature so high as to decompose the oil itself, when glycerine or acreoline, the result of its decomposition, are disengaged, and the free fat acid becomes dissolved in the oil.

The limits of temperature would be very difficult to follow in practice, and probably the elimination of foreign matters by this kind of torrefaction alone would be insufficient, if the idea had not occurred to Mr. Roth to introduce a compound capable of hastening the alteration of the impurities, and at the same time facilitate the reparation, by forming with them compounds insoluble in the oil.

This part is performed by a minium or peroxide of lead, abandoning at this elevated temperature of the oil a small portion of its oxygen, it oxidizes without entirely burning the albuminous matters, while at the same moment plombic oxide is generated, which is a very powerful base, with a strong tendency to combine with the abluminous, saccharine, pectinous, and other matters, is there to carry off the oxidized matters.

The colza-oil itself undergoes no change, and when its impurities have subsided, pyroleine of the colza represents the trassine and oleine of this oil in a state of great purity, without the quality or physical properties of the oil having undergone notable alteration. It contains only the slightest appreciable traces of lead, not amounting to $\frac{1}{1000}$th part. Careful experiments, instituted for the purpose, show that this oil thus treated, is in every respect equal to sperm oil, as a lubricator; and that machinery oiled with it continued working twelve successive hours without the bearings becoming heated. This result is of eminent importance to the manufacturing interest, seeing that colza-oil is not half the price of sperm oil.

M. Emile Rossaau has made a very important communication to the *Academie des Sciences*, on an improved method of purifying vegetable juices employed in the fabrication of sugar. Two kinds of organic substances obstruct the extraction of the sugar from these juices; the first kind belongs to the group of albuminous and caseous bodies; the second is a colourless substance, very greedy of oxygen, which quickly becomes coloured under the influence of the atmosphere, and is rapidly modified by the agents of oxidation. It becomes necessary to find, 1st, a substance generally but little soluble, which can coagulate all the albuminous matters, which can be easily removed from the juice in the event of any remaining in solution, and lastly, of a low price; 2nd, of another substance possessing a limited oxidizing power, which by its action can destroy the colouring matter, or transform it into a brown matter, and afterwards absorb it, and lastly, combine with the qualities of innocuity of action of the preceding body, a very low price. The body which appears best adapted to meet the conditions required is sulphate of lime, either natural or artificial. It is neutral, but slightly soluble, and without any action upon the sugar, and it is of very low price; to the condition of innocuity it adds a very remarkable power of coagulating the albuminous bodies in vegetable juices. This property is so striking, that a very small quantity is sufficient to produce the desired effect. It completely removes all coagulable matters, forms a very thick scum, and leaves the juice in a perfect state of limpidity, but it does not touch the colouring matter.

Animal charcoal is almost without effect on the colour immediately after the purification of the juice, it only removes the oxidized matters; for after it has acted upon the juice and deprived it of its colour, the juice soon becomes coloured again. An oxidising body, therefore, is required which can accomplish in a short time what the atmosphere requires a long time to effect, and which can so modify this colouring material as to absorb or destroy it. Among the substances experimented upon, the hydrated peroxide of iron presents the greatest advantages.

Thus, after all, the coagulable matters are removed from the juice by the sulphate of lime, it is agitated with a quantity of hydrated peroxide of iron, the liquor passes through the filter colourless, and purified from all foreign matters of every kind it may happen to contain. By the property peroxide of iron possesses of absorbing earthy and alkaline salts, the sulphate of lime which remained in solution, is removed from the juice, which readily crystallizes, free from any acrid or bitter taste, and it is, moreover, perfectly neutral to test-paper. The price of peroxide of iron is much lower than that of animal charcoal. The complex process of purifying saccharine juices is now reduced to one of extreme simplicity, which leaves nothing to be desired.

M. Girardin, in examining the solvent properties of bichloride of tin, or liquor of Libavius, finds that it is almost equal in that respect to sulphide of carbon.

M. Sudre, by an experiment which leaves no room for doubt, has confirmed the curious and important fact established by M. Boutigny—that the temperature of water, or of the globule of water in a spheroidal state, is 205° or 206° F., less than that of boiling water. The certain mode of verification adopted by M. Sudre consists simply in introducing the globule of water, into a calorimeter, and directly determining its temperature by the quantity of ice it causes to melt.

LONDON PHOTOGRAPHIC SOCIETY.

SIR,—I feel reluctance in again addressing you; but "A Former Member" has, while professing sympathy with me, expressed his views in such a manner and spirit, that in self-justice I feel bound to exclaim, "Save me from my friends." However he may agree with me, I strongly dissent from him; for no reform can ever be aided by rudeness of language or coarseness of manner. My only aim was and is, to call attention to present shortcomings, and to stimulate those who have our society's management to more vigorous action; as well as to express my doubts of the wisdom of the course of electing certain gentlemen on the council, of whom we have not had sufficient evidence of their fitness.

The next meeting is the annual one, and the only one throughout the year, when business matters may be discussed; and it will be seen if it pass over without some effort to amend matters.

In my former note, I attributed most of the deficiencies to the constitution of the society, and I still think so. I think it wrong to have so many gentlemen on the council; the responsibility is too divided and diffused. Half the number would manage it better, and have more credit and pleasure in doing it. The council should mix more with the members, letting them see who they are, and what they propose, and thus obtain their sympathy and support. They should not be elected for three years, with one-third going out annually; they should all go out every year, subject to re-election. There would be no fear of their losing their seats; good men are always appreciated. When elected, they should divide themselves into committees, according to their special abilities: one undertaking the internal affairs and general business; the other, fully alive to the vital interests of the art and science, forming their plans for improvement, extension, and development.

Photography is confessedly immature, and requires culture, guidance, direction. Except the PRINTING-PRESS, there never was an ART took such firm and vast hold of humanity. What was a toy has become a necessity. It is spreading everywhere; high and low, rich and poor alike partake of its blessings. It is potent for good and ill. It can hardly go lower, but how much higher may it not ascend? And who shall take it in charge? Who shall assist its aspirations? Whose duty is it, if not ours; for, to whom has it been confided, if not to us? Who are the photographic Titans but Fox Talbot and Archer? and where have they lived, moved, and had their being, but among us?

Our society, therefore, ought to be the chief of societies—a very Royal Society—taking the lead of all others,encouraging and setting them a grand example—a home where the noblest of the land might come and sit—where the highest Art and deepest Science should teach—whose meetings should be anticipated with ardour, and remembered with delight.

I would have our society one to which it would be an honour to belong, and a privilege to address; and to which access should be sufficiently difficult that, when obtained, it should be highly prized.

I would have an honorary council, or board of patrons, and a practical energetic one for managing its affairs. The former should be composed of the highest and wisest in science and art, who might be consulted on occasions, but who would not be expected to attend to details of business; and the latter, of men deeply imbued with our art, and anxious to aid its onward course.

Such is a hasty sketch of what I think might, ought, could, and should be done to render our society worthy of its high prestige and the original impulse with which it was projected.
PROGRESS.

PAPER POSITIVES DIRECT IN THE CAMERA.

MR. EDITOR,—In conjunction with a photographer of Cornwall I tried some experiments, during the last summer, in taking paper positives direct in the camera. The process is so far successful that I should be glad if you would communicate the same to your readers, in the hope that some of them may be induced to make trial of the same, and make improvements on the process; with some modification of the chemicals employed, it is capable, I have no doubt, of excellent results. Out of several methods, the following is the most satisfactory:—

Print photographic paper to blackness, fix and wash in the ordinary mode of photographic printing; dry; cut the paper to the size required; gum the back with gum dissolved in distilled water. Attach the paper to the middle of a well cleaned glass plate, one photographic size larger than itself. Dry flat under a slight pressure. Pour on and off albumen previously shaken in a bottle, with a little distilled water and a drop of glacial acetic acid.

It will be none the worse to repeat this albumenizing two or three times as the paper dries. When dry, coat, taking care that the collodion flows beyond the edge of the black paper; allow it full time to set. Now sensitize and expose for about the same time as a glass positive; develop with iron, &c.; fix with hypo or very weak cyanide; wash well; leave the picture soaking for some time in changes of water. If spots appear on the picture, they will gradually disappear in the water bath. Dry, varnish with albumen; if you think it needful varnish over the albumen with photographic varnish. The process is more easy to work than to describe, and so certain that any amateur may work it more successfully than with glass alone. The tone of the pictures is a warm mellow neutral, soft and well suited to portraiture. With a well blackened paper boldness may be obtained, which would render it useful for persons in trade wishing to transmit pictures by post. The few specimens I took in summer are still fresh and clear.

I have also tried negatives obtained by collodion on white paper. The results as yet imperfect, but such a process is scarcely needed, as the calotype process supplies all that is required. A little might be gained in point of sensitiveness perhaps, and I fancy a dry process, positive or negative, might be formed upon this process. I may add that papers stained black by any other than a silver stain, give dirty pictures. They would answer, although imperfectly, when varnished in the hands of photographers who are not particular about their baths. I am, sir, your constant reader,
ZAFFAR.

P.S.—In your treatise on "Photographic Chemicals, their Manufacture," &c., will yot tell us how to convert silver ore into nitrate. I have a goodly lump, which would be handy.

[It must be borne in mind that any experiments in this direction will have a tendency to derange the nitrate bath from contact with the albumen, it will be wise, therefore, to keep a separate bath for the purpose, as in the collodio-albumen process. We can readily conceive that the blackened silvered paper will have an effect in giving vigour and sensitiveness. We do not see any reason, however, for fixing the paper prior to using, as that operation would be effected at the same time the positive was fixed in cyanide. We shall not be able to devote much space to the production of the salts of metals from their ores; but may possibly give you some hints on the subject.—ED.]

PHOTOGRAPHY ON WOOD.

36, *Porchester Terrace, Jan.* 21, 1861.

SIR,—I hope you will allow me to say a few words in answer to a letter from Mr. Thomas Bolton, contained in your last number, referring to an incident which happened at the meeting of the Photographic Society on the 15th instant.

Two proofs from a wood-cut, accompanied with a wood block, bearing a positive photographic impression, and *not* engraved yet, were submitted to the meeting, with a letter from Mr. Leighton, mentioning Mr. Bolton's name only with his, and the necessary inference would be, that the photographic transfer on the wood block was their joint production, or, at any rate, the work of one of those gentlemen.

Mr. Bolton in his letter states, that the transfer photographs I made on wood for Mr. Leighton "were so imperfect that they could not be engraved, and had to be erased to give place to the same designs printed by his process, and that he, Mr. Bolton, is the first to have carried the process to a successful issue."

I happen to hold a letter from Mr. Leighton, in which he acknowledges the value of my invention—saying, that I am the first to have transferred photographs for him on wood, in this country, with success.

Mr. Leighton adds, that he did not mention my name in connection with the block done by me, which he was exhibiting, as "*he thought, I would not be proud of it*;" yet, he seems to have thought the work good enough to pass under his own name, otherwise—and putting the mildest construction upon the matter—Mr. Leighton failed, totally, in common courtesy, in exhibiting to a professional assembly, without my knowledge, a work of mine, which, he thought, "I ought not to be proud of."—I remain, sir, yours sincerely,

F. JOUBERT.

[Whilst not doubting the *bonâ fides* of Mr. Bolton in regard to the blocks actually engraved, we cannot refrain from here again expressing our conviction, that the uncut block exhibited at the meeting of the Photographic Society, was the one executed by M. Joubert's process, and seen in his atelier, by Mr. Warren De la Rue, and ourselves, and that the fair assumption was that the engravings were, therefore, executed from similar impressions.—ED.]

ON COAGULATED ALBUMEN.

IN the last number of your journal "G. P." comments upon remarks made by myself in connection with the enquiry as to whether the sensibility of a Taupenot plate is attributable to a structural or chemical change produced in the albumen film, by the aceto-nitrate bath. After referring to the erroneous ideas which he conceives to be existing respecting the coagulation of albumen, he proceeds to state that when albumen is heated to 165° it coagulates into a white solid mass. The idea that I have hitherto entertained has certainly been that if undiluted albumen be heated to the temperature of 146° to 150° Fah., coagulation will ensue; if this be an erroneous opinion, it is one shared by Brande, Fownes, B. Bruce, Jones, Hoffmann, and others. When the albumen is mixed with a large excess of water, it is true that the coagulating point will be materially raised, but not when the former is diluted with only twice or thrice its volume. To decide the exact temperature at which a mixture of albumen water and iodizing salts, as usually employed in the Taupenot process, will be converted into its insoluble state, I made the following experiment:—I diluted one ounce of albumen with two drachms of water, and dissolved therein 6 grains of iodide of potassium, and 2 grains of bromide of ammonium. The temperature to which the mixture could be raised without exhibiting any indication of change was 146° Fah., complete coagulation occurred between this and 148° Fah. In performing the experiment I took the precaution of heating the solution with as much uniformity as possible. Heating from below alone necessarily causes a material difference of temperature in different parts of the fluid operated upon. I cannot but conclude from the above, that an erroneous idea in connection with coagulation of albumen exists in the mind of your correspondent. In the next place it is a familiar and well known fact that albumen can be dried without coagulation, and that in this state it is "a pale yellow brilliant gum-like substance, destitue of all traces of crystalline structure. The dried white of egg may be exposed to a heat of 212° without any alteration of its properties. When put into slightly warm water it softens, and at length in great measure dissolves. When reduced to fine powder, and washed upon a filter with cold water, common salt, sulphate, phosphate, and carbonate of soda are dissolved out, together with mere traces of organic matter, while a soft swollen mass remains upon the filter, which has all the characters of pure albumen obtained by precipitation." (Fownes). To obtain, however, this soluble albumen, it is imperatively necessary that the water should be driven off at a lower temperature than that requisite to produce insolubility. In my experiment the albumenized plate was heated and dried simultaneously at 180°, so that both the structural and chemical properties of the film must have been altered by the process of coagulation. That the thin layer of albumen resting upon a collodion film can thus be entirely converted into its insoluble condition, may fairly be questioned; that it is partially so, I have no hesitation in believing. The views of your correspondent with regard to the inutility of having two sensitive surfaces, one under the other, as in the Taupenot process, the lower one being of no use except to complicate the process, as the image is on the albumen and not on the collodion, is diametrically opposed to extensive experience upon the subject. The sensibility of the iodized albumen is found to be considerably augmented by being super-imposed upon the collodion film, instead of resting directly upon the glass. In conclusion I may state that the practice of washing or diluting the free nitrate of silver from the surface of the plate, which, according to "G.P." rests upon erroneous ideas, is rendered imperatively necessary rather an account of obvious manipulatory and keeping requirements, than upon any theoretical or chemical necessity.

Jan. 22, 1861. THOS. SEBASTIAN DAVIS.

Photographic Notes and Queries.

INDIA-RUBBER FOR BATHS.

2, *Queens-sq., Westminster*, 12*th, Jan.*, 1861.

DEAR SIR,—It is somewhat surprising, considering the great want of a light, *unbreakable* substance to supply the place of glass and gutta-percha—the former for its unsuitable nature for travelling, and the latter for its non-resistance of chemical action. I say it is somewhat surprising that photographers have not given more attention to that very useful article, india-rubber; but I suppose it is attributable to the fact that they are more familiar with *vulcanized* india-rubber, which is *totally unfit* for use in photography, owing to the large quantity of sulphur it contains, but that generally known as best "stationer's sheet" is perfectly free from adulteration or foreign matter of any kind, and nothing is more suited to the present wants of photography than the *pure* gum, which has not the slightest action on silver solutions, or even on the most delicate solutions used in photography.

I most specially recommend it for baths and apparatus in general for *travelling*, from its extreme portability—a bath for whole plates, when *folded up*, being a convenient size for the waistcoat pocket.

How I arrange this, and how an amateur may make good and cheap travelling baths, &c., himself, I shall be most happy to communicate at some future period, and am, yours obediently.

LEO. DAFT.

Talk in the Studio.

NEW IODIDE.—The discovery of a new neutral and colourless iodide of starch, was announced by M. Duroy at a recent meeting of the French Academy of Sciences. It is well known that iodine gives a blue colour to starch, thus forming an iodide. M. Duroy brings this iodide into contact with yeast and thus deprives it of its colour. In this state it is very soluble in water, insoluble in alcohol, sweet, grummy and incapable of crystallization.

A NEW PHOTOGRAPHIC SOCIETY.—A society has just been formed in Newcastle-upon-Tyne for the advancement of photographic art and science, and is entitled the "Newcastle-upon-Tyne and North of England Photographic Society." The object is proposed to be attained by the reading of papers, experimental demonstrations, discussions, and conversations on all subjects connected with the art, and the exhibition of photographs, apparatus, &c. A society for the promotion of this delightful art, observes a provincial cotemporary, cannot fail to enlist a large amount of sympathy, and be productive of the greatest benefit. It already possesses a large number of members, and an active honorary secretary, Mr. J. F. McKie. From our knowledge of the general energy and indomitable perseverance of the men of this district, we anticipate that the society will prove a successful one.

HOW TO TAKE A FIDGETTY SITTER.—The editor of the *American Journal of Photography* tells a story of an artist "way down south in Dixie," who adopted a novel expedient to keep his sitter quiet. He had tried all sorts of suasions without success, when it occurred to him that the strongest of all human motives is fear. As soon as he had completed his adjuncts, he suddenly draws a revolver, and levelling it at the sitter's head, he exclaims in a voice with a look suggestive of lead and gunpowder: "Dare to move a muscle and I'll blow your brains out." The editor has not seen any of the pictures produced by this process, but has no doubt that they present some interesting peculiarities.

TOUCHING IN BLACK AND WHITE.—A correspondent forwards us the card of a provincial photographer, who, after announcing that he he has made arrangements for taking "portraits in miniature, (for brooches, &c.), also on canvass, and in every other style to which photography is applicable, in a manner superior to most, but inferior to none," proceeds to state that he "will continue to carry on chimney-sweeping as heretofore, and all orders shall be promptly attended to. The best machines kept, and contracts entered into."

IODINE IN RAIN-WATER.—M. Chatin informs the Academy of Sciences of Paris that he has found *iodine* in the rain-water of Pisa, Florence, and Lucia; and that although he had not succeeded in obtaining that element in its natural state from these waters, he had extracted it from two aquatic plants—viz., the *nasturitum officinale*, and the *ceratoppyllum demersum*, a fact which showed that the water in which they grew must have contained some.

INDIA-RUBBER PHOTOGRAPHY.—Mr. Fitzgibbon, an American photographer, writing from Guatemala to the *American Journal of Photography*, states that he has used india-rubber in the place of collodion. Sending specimens, he says—"the negatives were taken by a collodion, made of pure india-rubber-milk, ether, and alcohol, sensitized with iodide of ammonia, iodide of cadmium, and bromide of cadmium. The milk I obtain direct from the tree, and purify it by repeated washings in blood-warm water. The albumen paper was floated on a 140-grain to the ounce silver bath for five minutes; thoroughly washed in a weak solution of salt and water for about five minutes; toned in gold bath of proportion of ½ a grain to each of water—rinsed rapidly in water (say 30 seconds), and fixed in bath of 32 oz. water, 4 oz. hypo of soda, and 1 oz. acetate of lead. Washed afterwards in the usual manner. I find my india-rubber collodion negative turns dark and spoils after a few exposures to the sun; I am now experimenting with a view of obviating the difficulty."

REJLANDER'S PHOTOGRAPHS.—The *Athenæum*, noticing some of Rejlanders studies from life, says:—Six of these lying before us sustain the high reputation of the well-known operator. One of a young woman trimming her father's hair, and giving an unnecessary twitch to the old man, is noticeable for design and photographic success. "The Toilette," another, showing a young mother under the hands of an Abigail, while her child dresses a doll, is equally praiseworthy. For softness and truth of effect, the Wrestle studies from the nude, are admirable.

To Correspondents.

VOLUME IV OF THE PHOTOGRAPHIC NEWS.—In answer to several correspondents who have been disappointed in obtaining the volume complete, we have to announce that in consequence of the rapidly increasing circulation of the PHOTOGRAPHIC NEWS, several of the early numbers of the last volume are out of print. We are reprinting them as quickly as possible, and hope to have Vol. IV complete, ready in a few days.

PHOTO MINUS.—We shall possibly give some hints on the use of the oxy-calcium light at the conclusion of the articles on the oxyhydrogen light

M. U. D.—The best preparation that we know for the positive previous to applying oil colours, is a solution of isinglass in hot water, adding a little gin or spirits of wine after it has dissolved. It must be applied whilst warm, with a flat camel's hair tool. Let it dry spontaneously, and if necessary apply another coating. A little experience will teach you the proper thickness of the solution; it is better to use it somewhat thin and apply it several times, than to use it thick once, as in the latter case it is apt to crack off. We have found this an excellent preparation for our own use. The dirty yellow tint of which you speak arises from the oil coming to the surface, and in time turning horny. Use as little oil or vehicle with your colour as you can conveniently work with.

HENRY COOPER, JUN.—Your plate had probably been exposed to light between the application of the gallic acid solution and the pyrogallic solution, which would, on the slightly depeloped plate, produce, under certain conditions, the effect of a direct positive, whilst the fully developed plate would not be affected.

F. U. S.—The cement for glass we prefer for our our own use is marine glue, Shellac dissolved in alcohol answers for some purposes. You will find a good deal of information on the subject in our third volume, in treating of joining glass in the series of articles, "The Amateur Mechanic," and in other articles on the subject.

A FEW AMATEUR SUBSCRIBERS.—We strongly suspect from your description that the collodion is in fault and not the bath. If you put away a bath in good working condition in a chemically clean bottle, it ought, unless it has been tampered with, to work when next required. If, as you state, you could not get a trace of an impression, the faults more probably arose from insensitive collodion and under exposure, than from any other cause. All simply iodized collodions, in which alkaline iodides have been used, lose sensitiveness by keeping; as to the collodion of the maker you name, we have frequently had complaints of its rapid loss of sensitiveness. Use a collodion containing a bromide as well as an iodide. The method of correcting a bath to which you refer, we have always found perfectly efficacious. Do not readily despair. Where others have succeeded you may succeed Remember the child's song:

"All that other folks can do,
You by trying, may do too,
Try again."

THOMAS BARRETT —There appear many points of similarity between the apparatus invented by M. Pallu, described in our last, in the article "Photography without a Camera," and your portable camera, described at pp. 79 and 90 of our first volume. We recommend the attention of our readers interested in the subject, to read again the description of Mr. Barrett's camera in our first volume. We shall be glad to see yours, if convenient to you. We will communicate further by letter.

A. S. L.—Dallmeyer's new instantaneous stereoscopic lens is not intended to cover a quarter plate. It will, however, cover a plate 4 by 3, and answers admirably for portraits of that size.

R. C. B B. J., India.—In our next.

E. A. H —The wet process will present the fewest difficulties, and you will find it well to acquire facilities in taking negatives by the wet process before commencing to prepare dry plates. You will find it easier also to acquire that familiarity in your glass house than in taking views. In regard to your questions. 1. Coat the plate with negative collodion. 2. Use of bath of 35 grains of silver to one ounce of distilled water, as nearly neutral as will work clean. 3. Develope with pyrogallic acid 2 grains, citric acid 1 grain, or pyrogallic acid 2 grains, acetic acid (glacial) 15 minims; or protosulphate of iron 10 grains, acetic acid (glacial) 15 minims, and strengthen with one of the former developers and silver. 4. Fix with hypo and be careful to wash well. 5. If you require many prints always varnish the negative; if not, please yourself, use a hard spirit varnish. 6. Unless you require a large number and have not much time, print yourself. 7 Albumenized paper, which, as you have but little time, you had better bring ready prepared. 8. Sensitize by floating on a 60 grain nitrate of silver bath, and take care to keep up the strength, as it will diminish fast by use. See a paper on this subject by Mr. Hughes which will shortly appear in our pages. 11. Tone by the alkaline gold toning bath, and after fixing, wash very thoroughly with repeated change of water during about 12 hours. See PHOTOGRAPHIC NEWS ALMANAC for much of the information you require.

J. T. R. W.—If you use neutral chloride of gold, the addition of phosphate of soda is sufficient as given in Maxwell Lyte's formula. As, however, much of the commercial chloride of gold contains free acid it is best to neutralise it at once, by adding to the solution of fixed strength, sufficient carbonate of soda to render it neutral to test paper. From 2 to 5 grains of soda will generally be required for each grain of chloride of gold. About 15 minutes is generally sufficient time for prints to remain in the hypo. Some judgment, however, must be used, as much depends on the strength of the solution and the thickness of thespaper Thin paper is most quickly fixed. See announcement above regarding our 4th volume.

MARY.—You will find some information on enlarging in the PHOTOGRAPHIC NEWS ALMANAC, and we shall shortly have some articles on the subject. It entirely depends on the focus of your lens, and the length of your camera when extended, as to whether you can make your present appliances useful. If your quarter-plate portrait lens be about five inches focus, which is the usual length, your 9 by 7 camera will require to extend about 20 inches in order to enlarge stereo to the size you wish.

J. ANDREW is thanked for the curious document, which will appear in the column referred to.

AN ASPIRANT —A method of photographing on ivory will shortly appear in our columns.

Mr. RICHARDS on the albumen process will be given in our next

J P, R W R., Prendergast and others in our next.

MAJIC LANTERNS.—Several correspondents are thanked for their communications which will appear in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 126.—February 1, 1861.

WHAT IS A VARNISH?

This question is not so readily answered as may at first appear. In general terms, it may be defined as the solution of a resin in a suitable menstruum. This vehicle may be oil, or turpentine, or alcohol, chloroform, benzine, or other volatile liquid. The quality of a varnish must depend upon two things:—1st, on the nature of the resin or resins of which it is composed; and, 2nd, on the nature of the solvent.

First we examine the resins, not *gums*, as they are frequently called; gums are soluble in water, resins are not; gum arabic may be taken as a type of the gums, the solution of which in water forms *mucilage;* amber may be taken as a type of the resins, the solution of which, in a fixed or volatile menstruum, constitutes *varnish*.

The resins are hard, like copal, amber, and lac or brittle, like mastic, sandarac, or dammar;—or soft, like benzoin, elemi, anime, and the viscid turpentines, as Canada balsam.

The quality of the resin determines the physical characters of the varnish; for, as the solvent evaporates from its solution of the resin, except in case of oil, it must necessarily leave the resin in the state it was before being dissolved, consequently, a brittle, friable resin will never make a tough, hard varnish, and *vice versâ*. Hence, in order to estimate beforehand the suitability of a resin for a varnish adapted to a given purpose, it is necessary to examine its quality before being dissolved.

But the choice of the solvent is not arbitrary; certain resins require particular solvents; thus hard E.I. copal. is most readily dissolved in boiling linseed oil; so also with amber; these resins are scarcely soluble in turpentine, even under special elaborate treatment; they are not at all soluble in alcohol or ether, and amber is only partially soluble in chloroform. Mastic and dammar are soluble in turpentine, and partially so in alcohol.

It may happen that the qualities desiderated in a varnish are not furnished by any single resin, therefore it becomes necessary to add to it others which supply the deficient quality. Thus, to a resin which is too hard and brittle we add another that is soft and plastic; the compound is neither too hard nor too soft, but offers both sufficient tenacity and resistance.

When a resin is dissolved in oil, the oil in drying, as it is called, becomes oxydized, by absorbing oxygen from the atmosphere, and is also converted into a resin. In this kind of varnish the resin is greatly modified by the solvent. Turpentine generally retains some resinous matter in solution, which combines with the resin dissolved in it, and also modifies it, rendering it less easily drying, *tacky*, as it is called. Camphene, which is a highly rectified turpentine, evaporates without leaving any residue; it is, therefore, preferable to turpentine as a solvent of many resins.

If the solvent be too volatile, the varnish cracks in drying; for the solution spread out thinly over a large surface, suddenly loses a portion of its constituents, and the contraction not following the evaporation sufficiently quick, the varnish dries in detached patches, the intervals between them constituting the cracks. Cracking of a varnish may occur when, applied to a film, as collodion or albumen, it dries quicker than the film, and the unequal contraction tears the film into patches. Benzine, ether, and chloroform are, for this reason, objectionable as solvents, unless mixed with alcohol; although alcohol evaporates readily, it does not do so rapidly enough to cause the varnish to crack.

Heat aids the solvent power of the menstruum. Thus, to melt copal or amber, it is necessary to employ the linseed oil in a boiling state, which is a very high temperature, nearly 600° F.

Of all the substances proposed for photographic varnish, white lac dissolved in alcohol appears to possess the largest share of good and indispensable qualities. But it requires much skill and experience to ensure success in its manufacture; the addition of benzoin is thought to effect an improvement in it, by rendering it less brittle. Benzoin itself, freely soluble in alcohol, presents a ready substitute for lac varnish, but it will not endure such rough usage.

The subject to be varnished should be throughly dried before a clear fire, and the varnish warmed also. The presence of moisture produces the effect called *chill*, or *bloom*.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Agreement.—That natural and artful union of parts which gives force and power to the resulting whole. A picture's leading characteristics should influence all its parts, otherwise it runs counter to the laws both of nature and art. The law of agreement is frequently overlooked in what is termed "composition" photography, and it is by no means uncommon to see in a picture printed in from several negatives the most glaring inconsistencies. These more frequently arise from the fact of different figures, or portions, having been taken at different hours of the day, or when the light has changed in its nature. In a group of figures, &c., thus obtained, it is by no means uncommon to see the dark shadows of a weak light, and the weaker shadows of a strong light existing where but one light is supposed to illuminate the whole. There is much danger also of obtaining a similar defect from the unequal amount of intensity displayed in the different negatives; an undue depth of the shadows or strength of the lights in one negative giving qualities which may disagree with those of a differently developed or less exposed negative, thus destroying the truthfulness of effect and agreement of the whole, to the utter destruction of keeping and harmony.

Agreeable.—When a picture represents one of a class of subjects which are not very elaborate in their nature, and which do not contain any of the more refined subtleties of expression, or very great depth of meaning, it is usually described by this term as being opposed to the more lofty and grand of pictorial styles. With such subjects photography has dealt with far more success than can possibly reward its more ambitious efforts, and it were well in a general way not to aspire beyond the bounds thus indicated—within which the photographers' ambition may find ample scope for his best efforts, no lack of difficulties, and the largest share of promises.

Aim.—Every work of art should be governed by some particular aim or intention with which all its parts should be in keeping, and which should never be lost sight of during the various stages of progress. In photography, the choice of light, and of view, the exposure and development, the printing and the toning, may each and all be rendered subservient to some one aim or intention in connection with the general expression or effect.

Allegory.—A composition figuratively expressing something apart from that really represented. Photography has dealt with these subjects; and, in the hands of our very talented contemporary Rejlander, with no small success. Allegorical pictures should at once convey their real meaning, although their apparent subject should never be so closely connected with the real as to make the latter too obvious. Allegory has been compared to a crystal covering an object, although not concealing it; and it is usually represented in sculpture as a female vainly attempting to conceal herself within the folds of a transparent veil. Simplicity is a very valuable quality in an allegory.

Anamorphosis.—An eccentric piece of perspective which gives the effect of extreme distortion. It will arise from choosing a point of view injudiciously, or too near the object. Such results are very curious and amusing when secured for the stereoscope; and sometimes puzzle the amateur photographer, who, while conscious that such strange effects must be perfectly true, is at a loss to account for their distorted and eccentric appearance. The position of the camera in reference to the object is of the utmost importance in order that you may avoid representing an *anamorphosis.* It was the custom with teachers of perspective to illustrate this point by exhibiting a drawing monstrously deformed when seen in the ordinary position, but symetrical and truthful enough when placed in a certain unusual position, or viewed in a cylindrical mirror. Anamorphosis may be sometimes described as the quality of fore-shortening pushed to an extreme. Further information on this subject may, however, be procured from any work on optics.

Anacamptics.—A term indicating the theory of reflected light, which the photographic student will do well to make himself acquainted with: reflected light being one of the most important of his pictorial agencies.

Anaclastics.—The doctrine of refracted light.

Animated.—Applied to the successful indication of life in a picture. The artist does not understand by this mere perfection of detail in reference to form, or light and shade, but that which indicates vigour and general truth of effect, more especially with regard to action and expression. For such a quality, therefore, the photographer must study, say, the pose selected, in order that it may harmonise with, and lend force to the expression of his model's countenance. The eyes and mouth may vigorously express lively and active thought, but if the poor tame pose be one which has no agreement with such expression, the whole effect will be lost, which otherwise might well deserve the praise and secure the perfection implied in this term *animated.*

Antiques—No branch of our art possesses such real value as that which is devoted to the reproduction of the ancient specimens of classical or high art recognised under this term. With this idea the Greeks are most closely associated, inasmuch as the beauty, truthfulness, and grandeur of their productions are so generally admitted as to constitute the modern artist's ideal types of perfection. To reproduce such types in all their glorious qualities, with unerring faithfulness, and to circulate them through the whole world of art, refining the popular taste and cultivating the popular judgment, is surely a lofty and ennobling mission. If in so doing no object was served beyond the mere preservation of relics of such great and enduring interest, photography would still deserve our warmest gratitude. Such majestic works of art are even now in their distant lands crumbling into decay, or are being far more speedily destroyed by the almost daily devastation of tasteless but curious travellers, and ignorant natives, so that it is very probable that photography may soon have preserved to us the only remains of many such mighty productions. The statues which Phidias executed for Pericles; the works before which, 2,500 years ago, Plutarch stood and gazed with admiring wonder, or portions of those temples in which the most civilized and refined of ancient nations worshipped their poet-created gods, are brought by the aid of photography into the homes of our very humblest art-lovers, and preserved for generations yet to come. The study of the antique is regarded by artists as the most essential branch of their education, and photography may prove of great value in simplifying and accelerating such studies; or placing its means within the grasp of hundreds of poor aspirants for the painter's honours, from whom, without such aid, these means were hopelessly removed.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

Having given the best methods of preparing nitrate of silver from silver coin or plate, we think it will be as well to devote a little space to describe the best means of working up and converting the photographer's silver residues into a useful form. Usually it is recommended to keep several different receptacles for these residues—one for old baths, another for waste developing solution, another for exhausted fixing solution, &c. This may be all very well for those photographers who are in the practice of using up nitrate of silver by the pound or two at a time; but for the more numerous class, who deal with that expensive chemical by the ounce, we think that the plan of separate vessels and different treatment for each batch introduces more trouble and complication than the silver saved is worth. It must be remembered that it takes but a little more time to work up several pounds of material than it does a few ounces, and it may be well worth a photographer's time to devote half a day to extracting some pounds of silver from his waste solutions, when it would not pay him to devote that time to recover merely an ounce or two. We, therefore, advise, as the result of a pretty long experience in such matters, that all the solutions, whether baths, hypo, developing solutions, or anything else which may by any possibility be supposed to contain silver, be thrown into a large stoneware jar, of at least two gallons capacity, and having a wide mouth. This should stand in one corner of the operating-room, and all the washing waters, and wash developing and fixing solutions, poured from collodion plates should be allowed to run into this jar. As the jar soon becomes filled with the accumulated solutions, steps should be taken to precipitate the silver from it, and syphon off the clear supernatant liquid. For this purpose procure some *hepar sulphuris* (liver of sulphur, or polysulphide of potassium) which may be purchased at the chemists, or made by fusing together in a crucible two parts of carbonate of potash and one part of sulphur; dissolve it in about six times its weight of water, and when the jar is nearly full of residues add some of this solution to it until there is no longer a black precipitate produced. Allow the mixture to stand for about twenty-four hours, and then, having first tested the clear liquid with some of the sulphur solution, to make sure that all the silver has been removed from it, syphon or decant off the clear portion and throw it away, leaving the black sediment at the bottom. Now accumulate more residues in the jar, and repeat the operation of precipitation and removal of the clear liquid, until the black sediment has accumulated to such an extent that little room is left for any more solution. The sediment, which will consist for the most part of sulphide of silver, mixed with a little sulphur, must next be separated from the liquid and dried. For this purpose nail a piece of fine calico to wooden cross bars, so as to leave a hollow bag hanging down to form a filter; rest it on a convenient support and, after having well wetted it with water, pour the thick, black mud into it. Perhaps the first portions which come through may not be quite clear, if so return them to the filter till the filtrate is no longer turbid. The preliminary wetting with water is for the purpose of expanding the fibres of the calico before the thick mass comes in contact with them, otherwise they would expand around the particles of sulphide of silver, and the pores would be almost closed up and the filtration retarded.

When all the sediment has been placed on the filter, wash it once or twice by pouring common water over it, and then allow it to drain for some hours, and afterwards dry it in an oven on a plate. When dry it is ready for being reduced to the metallic state, which may be effected in the following manner:—

Fill a Cornish crucible with nitrate of potash, and place it on a good coke fire until it melts to a clear liquid, and the bottom of the crucible shows signs of becoming red. Then, having previously well powdered the black sulphide of silver, shake a little at a time into the melted salt by means of a spoon or the point of a knife. As each particle touches the melted nitre it will apparently dissolve in it with violent effervescence, and evolution of intense heat and light; too much must not, therefore, be put in at a time, or there will be risk of explosion. When the action appears to become sluggish, increase the heat a little in order to render the contents of the crucible, which will have now become pasty, liquid, and then, taking hold of the crucible by means of a pair of tongs, pour the contents out on to a clean iron plate. Replace it in the fire and fill up with fresh nitre, and continue projecting sulphide of silver into it until it is all used up, pouring it out each time the action appears to be slackening. Soon after the fused mass has been poured out on to the iron plate, and before it has had time to get cool, place it in a vessel of clean water, and let it digest there until the soluble portion has dissolved away, when metallic silver will be left behind, either in the form of a light, spongy mass, or fused globules, according to the temperature which has been employed. Well wash it by boiling in distilled water two or three times, and then dissolve in nitric acid, as recommended in previous chapters.

In the case of waste paper cuttings or filters, rags, &c., which may have any of the precious metal upon them, they should be burnt in a crucible, and the ashes thrown into fused nitrate of potash, as recommended above in the case of the sulphide.

One or two enquiries have been made us respecting the mode to be adopted in converting native silver ores into nitrate of silver. The most convenient plan will be to powder them, or if that is not practicable, to break them up into as small pieces as possible, and then to throw the powder into melted nitrate of potash, in the manner recommended above. At the end of the operation the temperature should be raised to a bright red, or full yellow heat, and kept so for ten minutes or so. The mass then poured out and extracted with water, will leave metallic silver. As however, ores seldom consist of their ingredients in a state of purity, and as silver ores may contain copper or other metals, which would prove injurious if allowed to find their way into the nitrate of silver, it will be safer to dissolve up the crude silver obtained in this manner in nitric acid, and precipitate the metal from the solution by means of copper. The reduced silver can then be dissolved up into pure nitrate, as previously recommended. If, as is almost always the case with photographer's silver residues, gold is present with the silver, the whole of this will be left behind, in the form of a dark powder, when the silver is dissolved in nitric acid. It should be filtered off, washed, (at first with a little dilute ammonia, to free it from any chloride of silver which might be present,) and then dried and placed along with the metallic gold accumulated in former experiments, until the quantity becomes sufficient to work up into chloride, or sell to the refiners. We must not omit to state here, that both silver and gold being articles of commerce, can always be sold for their real intrinsic value, the photographer may frequently prefer, after having obtained his lump of metallic silver, to sell it and purchase pure nitrate with the proceeds, in preference to being at the risk and trouble of converting it into nitrate himself. He will merely have to take the lump to a respectable assayer, where it will be weighed before him; in a few days the assay will be finished, and a paper showing the results of the assay, and the market value of the silver, less a small sum (6d. we believe) for the assay, will be handed to him. He is then at liberty either to take the lump of silver away again, or the money, whichever he pleases; silver prepared from residues in the manner recommended at the commencement of this chapter should always be commercially pure, and will fetch 5s. 2d. per ounce. In most cases photographers will find this the most economical plan of converting silver into nitrate—it is certainly the least troublesome.

HOW TO ASCERTAIN THE AMOUNT OF SILVER IN A NITRATE BATH.

With Remarks on Argentometers and Bath Testers.

BY C. JABEZ HUGHES.*

The purpose of the present paper is purely practical, and bears reference to one I read at this Society about twelve months since. I then expressed my belief that many of the faults of albumenized prints arose from having the sensitising solution too weak, and recommended the use of a little instrument known as the silver-bath meter, based on the principle of the hydrometer, to insure that the silver solution should never be employed below a known strength. I recommended the instrument then, not as a perfect one, but as very simple, easily managed, and sufficiently accurate for the *printing* solution.

Since then I have heard it often spoken of depreciatingly, and even denounced as leading *only* to false results. As I am not aware that any body has gone through experiments to ascertain how far it is right or wrong, or of comparing it with other instruments for accomplishing the same object, and being still convinced that I had derived much benefit by its use, I determined to make a series of experiments to satisfy myself of its exact value. Understand me, I am not the inventor of this instrument, I did not bring it out—I do not know who did, and am its advocate only so far as I believe it to be useful in aiding the production of good prints.

Many methods have been proposed to ascertain the amount of silver in any aqueous solution. They are nearly all based on changing the soluble into an insoluble salt; one method judging by the quantity of precipitate produced, the other by the amount of material required to cause the complete precipitation.

The silver may be thrown down as a chloride, cyanide, sulphuret, oxide, or metal; but from the nitrate solution it is most readily treated as a chloride.

When a perfectly accurate result is required—a nitrate solution being under examination—it must be strongly acidified with nitric acid, and pure hydrochloric acid added till all precipitation ceases. After well shaking let it settle for some hours; decant, and wash the precipitate well and carefully with distilled water. Do this many times, till the last water ceases to redden litmus paper, then decant, evaporate, and fuse the chloride; finally, carefully weigh, and the amount of nitrate of silver contained in the quantity of solution can be inferred from the amount of chloride obtained, allowing 3½ grains of the nitrate for every 3 grains of chloride; the exact proportion is 3 of the former to 3·555 of the latter.

This method is theoretically correct, and if perfectly conducted must lead to exact results. It is, however, far too troublesome and lengthy for our daily wants, and requires a person to be acquainted with chemical manipulation.

A much readier method is based on the principle that, as there is only a limited quantity of silver in any solution, if we can know how much chloride is required to precipitate it, we can from that infer the quantity contained. This saves all the trouble and time of collecting, washing, drying, and weighing the precipitate.

Many applications of this principle have been published. Mr. Heisch read a paper sometime since, at the Blackheath Photographic Society, which was published in the journals, in which he showed how silver can be estimated to the hundredth of a grain per ounce solution.

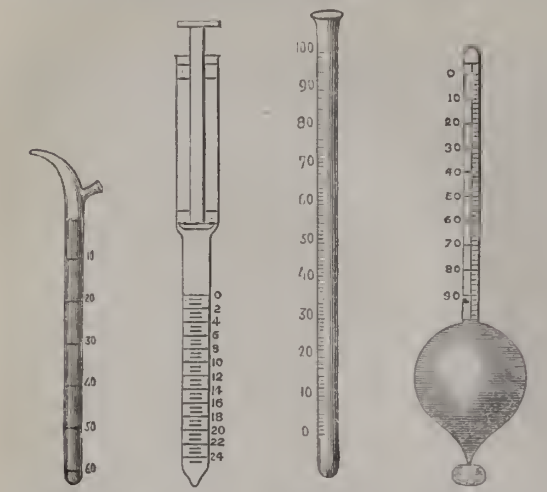
In the Appendix of Mr. Hardwich's "Photographic Che-

* Read at a meeting of the North London Photographic Society, Jan. 30th.

mistry," another method is given, accurate to one grain, or even half a grain, per ounce.

These methods are based on making standard solutions of certain exact strengths of pure chloride of sodium, and, according to quantity required to cause precipitation, is calculated the amount of the silver. These operations require to be most carefully conducted, or correct results cannot be obtained.

To obviate the trouble of calculation, certain instruments have been invented, graduated to scales suitable to certain standard solutions, to be used with them.



Wood's Argentometer.* Hockin's Argentometer. Horne & Co's. Bath-tester. Hydrometer Silver-tester.

Mr. E. G. Wood's argentometer is a glass tube, graduated from 0 to 60, which he fills to 0 with a standard solution of pure dry chloride of sodium 33 grains, distilled water 13 ounces 1½ drachms. Into a measure glass is placed a drachm of the nitrate bath, into which the saline solution is poured from the graduated tube. A dense white precipitate of chloride of silver instantly falls. The standard solution is added until the last drop or two causes no more precipitate, when the quantity of the solution used from the graduated tube shows by the number of the division at which it stands how many grains per ounce of nitrate the bath contains. Thus, if 30 divisions of solution are used, the bath contains 30 grains; if 40 divisions, 40 grains, and so on.

Mr. Hockin has devised another form, a graduated syringe, It is used with a standard solution of pure dry chloride of sodium, 69 grains (68, 94) in 1000 minims (2 ozs. 40 minims) of distilled water. In using, one or two drachms of the nitrate bath are to be added to an equal bulk of nitric acid and twice or thrice the amount of distilled water. Fill the instrument to zero, by slowly raising the piston, the point being kept under the test liquor. Depress the piston and cause the saline fluid to pass into the portion of bath prepared as above, vigorously stirring all the time. A heavy white precipitate of chloride of silver takes place directly. The solution requires well stirring, and the standard fluid added till only an opalescent appearance remains, and when, after drop by drop being used, no more precipitate is formed, the operation is complete. The number of graduations left empty indicates the number of grains of nitrate contained in the quantity of solution examined.

Messrs. Horne and Thornthwaite's bath tester is a graduated tube marked from 0 to 100. They employ a standard solution, pure dry chloride of sodium 84¾ grains in 20 ozs. distilled water.

* We observe at the last moment, when it is too late to remedy it, that the engraving of Mr. Wood's instrument is on a somewhat smaller scale than the others.—Ed.

To use, fill up to 0 with the nitrate bath to be examined, then gradually add the test solution, shaking violently between each addition. When no more precipitate is produced, the number of graduations at the top surface of the fluid, shows the number of grains to the ounce of nitrate of silver contained in the solution examined.

The other instrument I introduce professes to estimate the strength of the nitrate of silver solution on the principle of the hydrometer.

It has only to be immersed in the solution, and the number on the stem of the tube, where the surface of the solution intersects, shows the supposed number of grains of nitrate of silver contained in each ounce.

With a view to form a correct estimate of the value of these instruments, I undertook a series of carefully conducted experiments upon five different nitrate solutions. I may mention that so important did I consider these experiments, and so anxious was I to avoid error, that I asked the assistance of a gentleman of undoubted qualifications, Mr. G. Wharton Simpson, who kindly gave me the best part of one day to assist in verifying and working them out.

These experiments were performed with great care. Pure, well dried chloride of sodium was accurately weighed and dissolved in distilled water as directed.

Of the five solutions of nitrate of silver tested, two we made up ourselves, one ten grains the other thirty grains to the ounce, and being tested directly they were mixed, no foreign substances were present to influence the result. Another solution was a portion of a bath used for albumenizing paper, which was mixed, I cannot tell when, certainly some years since, and has always been receiving additions of nitrate of silver and distilled water, and was, therefore, an extreme test. A 60-grain solution of port wine colour I obtained from one of our Regent-street photographers. It had been used to sensitise only a few sheets. Another bath tried was one made up about four months since, and has been constantly in use for sensitising collodion plates, negatives and positives. Here are the results as shown by the different instruments:—

	Hydrometer Silver-tester.	Wood's Argentometer.	Horne & Co's. Bath-tester.	Hockin's Argentometer.
New 10-grain bath	10	11	12	12
New 30-grain bath	30	31	29	31
60-gr. bath, port wine colour	60	61	60	62
Old albumenized paper bath	56	56	54	56
Collodion plate bath	16	25	23	25

It will be seen from the above experiments, that where the exact strength of the solution was known, that in only one instance did a "standard-solution" give the precise strength, they generally indicating one or two grains over or under.

That there should be such variations is only reasonable, for unless the most scrupulous care be taken, many errors may creep in. The chloride of sodium may not be quite pure or dry, and the graduated measure not quite accurate. Then the minim glass, with which the drachm of nitrate bath is measured, may not be graduated very perfectly, and we know in commerce how they vary; there is also the risk of putting in too much of the test solution at he very last, to ensure all the nitrate being thrown down; all these are sources of error which are always more or less present when these instruments are in the hands of the general public. Again, as there is only a drachm of the nitrate solution experimented on, from which to infer the quantity contained in the ounce, it is clear that if there be an error it is magnified eight times.

It is hoped these remarks will not be considered as depreciatory of these useful and ingenious instruments, as they are only intended to show the great care necessary to prevent obtaining false instead of true results. In our experiments we might have used graduated glass measures that had been verified by standard ones, but we felt this unnecessary, as we wished to place ourselves in the position of an ordinary operator, and, therefore, employed the usual well-made, graduated glass measures that are supplied by respectable houses.

If proper precautions be adopted, our impression is that these instruments may be relied on for giving within about two grains, either over or under, the exact amount of the nitrate contained in each ounce of solution. In our experience they appeared to rather over-estimate the amount. We do not feel at liberty to say which is the best of the three, as they are all different, and have each a merit peculiar to itself.

Messrs. Horne and Thornthwaite's does not require any additional graduated measure for the drachm of nitrate solution to be examined, by which one source of error is removed. Mr. Wood's is very neat and elegant, and the result very easily read off. He has two forms, and we used the cheaper one. Mr. Hockin's graduated syringe is theoretically, perhaps, the most perfect; and when a person has got used to it he may work it very exactly, but we fancied if the standard solution was less concentrated, or the graduations made wider, it would be an improvement; but we have only to repeat, they are all very ingenious, and do their work without giving the trouble of calculation. They are equally applicable to the bath for sensitising collodion plates and albumenized paper, but must not be used in solutions containing cyanides or hyposulphites. The other little instrument, based on the hydrometer principle, when tried in new solutions of known strength was found to be *absolutely correct*, and on the very old printing solution, which was the real practical text, it corresponded with two out of three of the standard solution tests, and only differed two grains from the third.

The principle on which this instrument is constructed, the increased weight communicated to water by the addition of nitrate of silver, is quite hostile to the introduction of such light fluids as ether and alcohol, and as the bath for sensitising collodion plates always contains these, it was hardly necessary to try it in our old bath used for this purpose. Still as we tried the other instruments we tested this, and, as we supposed, it did not register correctly, showing much less nitrate of silver than the bath contained. This instrument, then, is not fitted for solutions of this character; but, as the errors are only on one side, even this peculiarity may occasionally be useful, for *it never can register* MORE *nitrate of silver than the bath contains, always less.*

Speaking generally, then, this instrument is less perfect than the others, because it is applicable to only one of the two photographic silver solutions; but for that one it answers admirably, and may be depended upon even more certainly than the others; and as this solution, the printing one, is the one that is daily required to be tested, the little instrument should be considered as peculiarly fit for it, and it only.

I began these experiments without the knowledge of the degree of accuracy of these argentometers. I determined to test them all carefully and strictly, and to record the results impartially. I am happy to bear testimony to the usefulness and practical approach to perfection of the gentlemen's instruments whose names I have mentioned. With respect to the other instrument I confess I had many misgivings of it, for one cannot avoid being influenced by frequent condemnations, and I am agreeably astonished at its great accuracy in its more limited vocation. That it fails in the presence of ether and alcohol is what every intelligent person would have surmised.

I think, therefore, that each of these instruments should have credit for what is due to it, and that every photographer should have one of each; the standard-solution one, for testing his collodion bath, which he should do himself, say once a week, with all the precautions against mistake already named; and the other for his assistant or printer to be used daily, for he has only to immerse it and the strength of solution is told.

After rendering due justice again to the useful and ingenious instruments I have named, I yet feel justified in again recommending the hydrometer silver-tester for ascertaining the strength of the silver printing solution, and conclude with the words I used about a year since: "the merit of this little instrument is its simplicity. Without professing analytical accuracy, or the perfection of more complicated instruments, it is sufficiently correct for all practical printing purposes, and no knowledge of chemistry is required for its use. It is always ready, needs no calculation, and the dullest boy can employ it."

Photographic Notes and Queries.

ALBUMINATE OF SILVER FOR FOTHERGILL PLATES.

SIR,—Experimental photography being just now so much practised, perhaps some of your many readers may feel inclined to test a new method (new to me at any rate) of introducing the albuminate of silver in the Fothergill plates, I have only tried 2 or 3 small plates, but find they are as sensitive at least as the old ones, and with greater rapidity of development, I think. I do not intend to say that they are an improvement on the original manipulation, for I have not experience enough to fully test that. I make a collodion plate sensitive in the usual way, well wash in four waters, and pour over it this prepared albumen, (Fothergill albumen 2 drachms, water 6 drachms, a few drops of bath solution dropped into it, and shaken up, when, if the silver has not been added too liberally, it will redissolve the precipitated albuminate), drain the plate ten minutes or so, and dry, which completes its preparation. The first plate I prepared I tested by this means: I laid on it an opaque disc, and put it under a fish-tail burner for a few minutes, when on removing it I plainly saw the impress of the light; it developed with pyrogallic into a transparent circle. It is not usual, I believe, to see the image before development, on an iodide of silver film. W. B. B.

[The plan proposed might tend to increase sensitiveness, but it would at the same time injure the keeping qualities.—ED.]

Miscellaneous.

THE DUC DE LUYNES PRIZE.—We have been favoured by Herr Pretsch with a copy of a letter received from the committee appointed by the French Photographic Society to award the prize of 8,000 francs offered by the Duc de Luynes for the best process of photolithography or photogenic engraving. The committee having examined the works of the various competitors, name the processes of Messrs. Poitevin, Pretsch, and Charles Negre as especially worthy of praise. They then proceed to state that these works give the hope of a satisfactory solution; but, considering that the results obtained as yet are not complete enough, considering, moreover, that the authors themselves have not had the time to test properly the application of their processes, nor to give them all the perfection of which they were susceptible—the commission decided that they ought not to determine the question just at present, and that the competition should be put off to April, 1864.

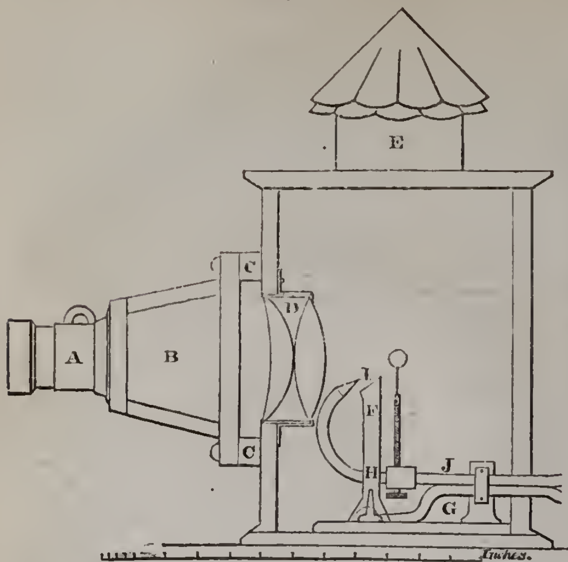
MAGIC LANTERNS.

WE select the following from the letters we have received from various correspondents relative to the use of portrait lenses with magic lanterns. Numerous readers who have made inquiries on this subject will here meet with information to guide them in their experiments.

DEAR SIR,—According to promise, I enclose you a sketch of a magic lantern, I have constructed, using my portrait lens as the objective. It is drawn to the scale of 2 inches to the foot or one sixth the actual size.

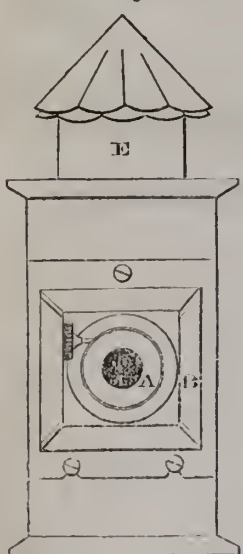
The body of the lantern is made of half-inch pine board, also the projecting front B, carrying the lens A. this part is attached to the cross-pieces C, C, by means of three screws as shown in fig. 2.

Fig. 1.



The condenser D, consists of a concavo-convex and a double convex lens, about 4 inches diameter, mounted in a tin-plate tube, and placed as near together as possible without touching.

Fig. 2.



The chimney E is also of tin with two conical caps to shut off all light.

The form of light I have adopted is a modification of the oxycalcium, the difference being in the substitution of common coal gas for the moro expensivo spirit flame. F is a metal tube, five-eighths of an inch in diameter, slightly flattened at the upper end; and the lower being sawn into threo for about an inch of its length, and bent asunder, will form a tripod or stand.

The tube G is of lead, into the end of which, at right angles, is inserted a small jet, H, with an orifice about tho size of a common pin. The gas issuing from this mixes with atmospheric air coming from below, and burns at I with a clear blue flame, free from smoke.

J is another lead, or other metal tube, conveying oxygen from the gas-bag to tho lime ball in the usual manner.—I am, sir, yours truly,

J. W. Reffitt.

Sir,—In reply to "A Reader," respecting magic lanterns, I have made one of wood of the following dimensions outside. Height 18 inches, length 12 inches, width 10 inches. The bottom for the admission of air, is on the plan of the ordinary magic lanterns. I procured from an optician two plano-convex lenses, 4 inches diameter and 6 inches focus each. These I fixed in a cell, with their convex sides facing each other. These form my condensers, which I place just within the lantern, opposite a hole cut out of the front of the lantern, sufficiently high from the bottom to be opposite the centre of the lamp. To the front of this I attached a tube of wood 10 inches long, each of the sides being $5\frac{1}{2}$ inches outside, tapering a littlo towards the end. At tho end I fixed my half-plate portrait combination (not having a quarter-plate one). The lamp is a patent moderator, for burning oil. I get one pint of pale rape oil in which I dissolve three pennyworth of camphor, which I find greatly enhances its illuminating properties. I have tried sperm oil with camphor, which is much dearer, but without any appreciable difference in the light. The light thus obtained is brilliantly white, and of intense heat. Care must be taken to have the lamp perfectly under the chimney of the lantern, which should be high and bent at the top. My chimney is made of tin. The pictures I get on the screen from the ordinary painted slides are beautiful, and perfectly sharp, but not large, owing to the long focus of the lenses.

The pictures thus produced being much smaller than I wished, I procured two more plano-convex lenses, 2 inches diameter and 6 inches focus each. These I placed each with its convex side to the lantern, just behind each other. I now get a large picture quite sharp, but the lines appear coarse, being so highly magnified. I therefore prefer the beauty of the pictures produced by the portrait lenses. I have tried photographs in this lantern, but not to my satisfaction. Being far from perfect in producing photographs for this purpose, I am looking forward with great anxiety for your promised articles on transparencies.—Yours, J. R.

Liverpool, Jan. 21st, 1861.

Another correspondent writes:—

A reader ask for information about a magic lanterns. I have made one, which is simply an oblong tin box, 13 inches long, 12 deep, and $7\frac{1}{2}$ wide, with a sloping top. I got a pair of condensers 4 in diameter, 8 inch focus, which I mounted in tin rims, which fit each other like the lid of a canister, (with tho convex sides insides); these fit in another tin rim soldered inside the lantern round the opening in front, which opening, of course, is the diameter of the condensers.

To attach my lens to the front of tho nozzle of the lantern I have a tin plate soldered on the front, with the edges beaten over, so as to form a rabbet, into which I slide the front of my camera which carries the lens, so that I can change it from camera to latern very rapidly.

I use a solar oil lamp, and have been trying to apply oxygen to it, but have not been very successful.

Proceedings of Societies.

North London Photographic Association.

The usual monthly meeting was held at Myddleton Hall on the evening of Tuesday the 30th ult. Mr. George Shadbolt in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Woodward of Nottingham, and Mrs. Chapman were elected members of the society.

The Chairman called the attention of the members to some exquisite specimens of photography on the table, which had been presented by Mr. Bedford to tho portfolio of tho society. He took occasiou to commend Mr. Bedford's example in presenting these pictures to the members generally. The portfolio he might remind them was always on the table, except when out in the hands of some member. Any gentleman wishing to borrow it at any time, could do so on application to the secretary, who, if the portfolio wero at tho time engaged, would place the applicant's name on a list for receiving it in the order of his application.

Mr. Hughes then read an interesting practical paper on "How to ascertain the amount of silver in a nitrate bath," (see p. 51) which was received at its conclusion with hearty applause.

The Chairman remarked that on the principle that one volunteer was as good as two pressed men, he scarcely need call for a vote of thanks with applause, having already awarded it. In proposing a vote of thanks he thought they ought to include the gentleman who had assisted in and verified Mr. Hughes' experiment—Mr. Simpson. The thanks of the meeting were then unanimously voted to these gentlemen.

Mr. Hughes then stated that he had brought solutions and apparatus, and would repeat in the presence of tho meeting some of the experiments he had described in his paper.

The Chairman said whilst Mr. Hughes was preparing he would make one or two comments. In reference to the remark that for accurate experiments hydrochloric acid should be used to convert the silver into a chloride that was unquestionably true, as there was no doubt about the fact that alkaline chlorides do hold a portion of silver in the solution. Referring to the hydrometer form of instrument for testing purposes, there was an admirable instrument on this principle made by Negretti and Zambra, which being much longer in the tube, and, being used in a tall narrow vessel, afforded facilities for reading off very accurately, and experimenting with a very small quantity of solution.

Mr. Hughes said, probably if the instrument were more used still better forms might be devised. The one he had used, and which was generally prepared for this purpose, had the advantage of not taking up much space, and not requiring any other especially prepared glass to use it with, any ordinary glass answering the purpose.

Mr. Hill asked if the accumulation of other matter in old sensitizing baths would not add to the density of the solution and thus interfere with the value of the registrations of the hydrometer which were based on specific gravity simply.

The Chairman thought the experiments gave a sufficient answer to that. Here was a solution which had been in use for several years which gave results by the hydrometer test, which varied very little from those which were tested chemically, by converting the silver into a chloride.

Mr. Hughes then proceeded to test, by the several instruments named, a new 30-grain solution of nitrate of silver. The registrations were as follows :—Hydrometer gave 30 grains; Wood's Argentometer gave 32½ grains; Horne and Thornethwaites Bath Tester gave 27½ grains; and Hockin's Argentometer gave 48 grains. In course of conducting the experiments Mr. Hughes availed himself of the aid afforded by a drop of a solution of bichromate of potash, added to the silver solution, and explained the beautiful delicacy it added to the testing operation. On being added to the nitrate of silver solution, silver, having a greater affinity for chromic acid than for nitric acid, was at once thrown down as a red precipitate of chromate of silver. The silver, having, however, a still greater affinity for chlorine, left the chromic acid on the addition of the standard solution of chloride of sodium, and the red precipitate of chromate of silver gradually disappeared, until the whole of the silver was converted into a chloride, when it immediately became quite white. The colour materially assisted the eye in detecting the moment of change, and enabled great nicety to be used. The presence of the chromic acid, moreover, materially aided in causing the precipitation to aggregate, and keep the supernatant liquid clear for observation.

Messrs. Horne and Co. recommend in their published directions for using their bath tester, to add one drop of a 20-grain solution of bichromate of potash, before the addition of the standard solution, and also point out the exceptional cases where it is not useful.

Mr. Hughes then explained that the discrepancy in the results now presented doubtless was due, not to the instruments, but the manipulation, there being great difficulty in reading off with accuracy the gradations on the glass tubesby the light the distant gas afforded, and in the case of Mr. Hockin's instrument especially, more care was necessary than the circumstances afforded, the form of the instrument causing a danger of losing some drops of solution, the concentration of which made every drop lost cause a serious amount of error. In the experiments Mr. Simpson and himself had conducted, the utmost possible care had been used, and the results had been more exact.

Mr. Burr asked if any pains had been taken to test any of the solutions, and ascertain first the exact amount of silver contained, so as to ascertain the accuracy of the test afforded by the different instruments, and referred to the experiments of Gay Lussac undertaken for the French Mint, as showing an admirable method of accurate argentometry. He also asked if the methods proposed by the makers of the different instruments had been examined for strict chemical accuracy, and to ascertain whether they were based on a recognition of the same equivalents.

Mr. Hughes explained that his object had not been so much to enter into chemical refinements into which photographers generally would not have followed him. Nor had his object been to test and report upon the accuracy of the various instruments made for testing silver solutions. His aim had been to take things as he found them in the photographer's hands, and try them under the ordinary conditions which photographers would try them. He used, therefore ordinary commercial nitrate of silver, and ordinary graduated measures for measuring the solutions. The accuracy of the instruments might be gleaned rather from a comparison of their relative registrations, than by a comparison with something which he might have called a standard.

Mr. G. Wharton Simpson added that the first experiment with which he had assisted Mr. Hughes was one based on the very principle to which Mr. Burr referred, that adopted by Gay Lussac in his experiments for the French mint, and which had been introduced to photographers by Mr. Heisch.

Mr. Hughes remarked that the very delicacy of such experiments only made the danger of error greater if the measures, weights, or manipulations were not all equally delicate and perfect with the test proposed. He had not, therefore, included that experiment in his statement, as he wished to deal with the question as photographers generally would have to do, with just such facilities as were commercially supplied to them.

Another experiment was now tried with old negative nitrate solution.

Mr. Hughes remarked that this solution was handed to him by a professional photographer, with a statement that it was not working well. It was supposed to contain organic matter, which produced irregular reduction in development. If this were the case, and the bath were of the normal strength, the organic matter, unless present in large quantities, would not materially affect the reduction; but if the bath were weak, then a small quantity of organic matter would become a serious disturbing agent. The first point to ascertain, therefore, would be the strength of the bath. He would try it by Wood's test as being the easiest to manipulate.

This solution, which had been made originally made 30 grains to the ounce, now registered 26 grains. Mr. Hughes remarked that when he tried it at home it registered 22½ grains; so that it might be fair to take the mean amount, and call it 24½ grains.

Mr. Louch asked if Mr. Hughes had not in the course of his paper stated, that the collodion bath did not need testing. He thought this experiment showed its importance.

Mr. Hughes had said just the contrary, if not in so many words, at least by implication. One of the experiments recorded was with such a bath, which would not give dense negatives, and was supposed to be influenced by the cold weather. It registered by the hydrometer 16 grains, and by the argentometer 25 grains, when it had been supposed to contain 30 grains. He regarded it as of the utmost importance; and as the hydrometer was not a safe guide in such cases, he had recommended the possession of both an argentometer and a hydrometer—the former for occasional, the latter for daily use, as even a boy could use it.

Mr. Barber asked if twenty grains of chloride of sodium were added to a thirty grain silver bath, what guidance the hydrometer would furnish as to the amount of silver. He thought that the accumulation of chloride in the printing solution made this an important point.

Mr. Hughes thought this really would not occur in practice. The experiments with old baths had indicated the contrary.

Mr. Louch suggested that the argentometer could be used for the purpose of testing the purity of the silver, as there was reason to believe it was often adulterated.

The Chairman remarked that before applying it to decide such a question, the argentometer itself ought to be tested by some known accurate standard.

Mr. Hughes doubted whether it would be fair in practice to adopt the method Mr. Louch had suggested. Reversing the position, would any gentleman present, if he were the dealer, like to be judged by such a standard? The possibility of error in the graduation of the argentometer, or of the measure, or of the standard solution, or of the manipulation, would certainly render it unsafe and unfair to pronounce a sample of silver impure, or base a charge of fraud by such a standard. The experiments performed by Mr. Simpson and himself were performed with all the care of which the appliances would admit, and yet they had some variation in result, on performing the experiments twice.

Mr. Quin remarked that there was a very simple and elegant test for the presence of adulteration in nitrate of silver. If the whole of the silver in a nitrate solution were thrown down by means of pure hydrochloric acid, and a drop of the supernatant liquid evaporated on a glass, there would be no crystalline residue if the silver were pure. If on the other hand nitrate of potash or nitrate of soda—the commonly supposed adulterating salts—were present they would crystallize on evaporation.

The chloride of silver might be further tested by dissolving in ammonia. He had not, however, on any occasion found any wilful adulteration present in commercial samples; although they were frequently much contaminated with organic matter.

Mr. Dawson, referring to the printing bath, thought that the accumulation of the nitrates of potash, soda, or ammonia would affect the specific gravity.

Mr. Hughes again referred to the evidence of the experiments. Mr. Simpson and himself first took a new solution and tried the hydrometer and the argentometer, and found that they agreed within one or two grains; they then took old solutions and found that the discrepancy was no greater. He had scarcely been prepared for so little disturbance of the specific gravity; but there were the facts. He thought that perhaps the fact was overlooked that comparatively little of soda, potash, or ammonia was dissolved into the bath; but was chiefly retained by the paper. If these salts had been largely present they would undoubtedly have had a more disturbing effect. A thirty grain solution of nitrate of soda would register with the hydrometer only twenty grains.

Mr. Simpson suggested that as the albumen was coagulated immediately on contact with the nitrate of soda, that would tend to imprison the soda, potash, or ammonia, and prevent its rapidly dissolving into the nitrate bath.

A general conversation on this subject ensued, in which Mr. Hughes explained that the experiments had in each case been tried with a drachm of nitrate solution, but had been stated in ounces; of course by this method any fraction of error was multiplied by eight.

Mr. Dawson remarked, that the hydrometer principle was so simple that he had prepared several graduated for different strengths; and, in mixing new solutions, used them instead of weighing out the silver: but for old solutions he had not the same confidence in using them.

Mr. Hill referred to silver baths, in which almost the whole of the albumen was dissolved off the paper, as affecting specific gravity.

Mr. Dawson said an impression prevailed, that it was the weakness of the silver bath which caused the albumen to be dissolved. He thought that this was not always the case. He had tried albumenized paper on new baths of all strengths, down to five grains, without dissolving the albumen. He thought it was rather due to the accumulation of ammonia in the bath, or even in the paper; the compounds of ammonia being so unstable, he thought that it sometimes existed free in the albumenized paper.

After some further conversation the subject dropped.

The Chairman then called attention to the election of officers which would take place at the next meeting, any member being at liberty to nominate such gentlemen as he thought suitable.

Mr. Hill announced that Mr. Barber had just promised a paper on "The Purification of Nitrate of Silver," for the next meeting. The subject would form a fitting sequel to Mr. Hughes's paper.

The proceedings then terminated.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 30th January, 1861.

Our photographic atmosphere has been intensely agitated by the tidings that the problem of photographing on wood is successfully solved. Our expectations have been frequently raised to a high pitch, and as frequently disappointed, but as there appears to be no doubt about the fact on this occasion, we may venture to shout and clap our hands in consonance with the ingenious discoverer's "*Eureka!*"

As it is known to a select few in this metropolis that I am the individual honoured in the appointment of being your "Special Correspondent," of course I was besieged with applications for specimens of photography on wood. These I regret to say I could not gratify in the manner I desired; but a copy of the *Illustrated London News*, containing a representation of one of Flaxman's bas-reliefs stood me in good stead. I hope, however, to obtain some wood blocks with designs photographed upon them, in time to exhibit at the next meeting of our Photographic Society; in that case I will report to you the opinions which may be expressed on this, one of the most important applications of photography yet made. It will doubtless effect a great change in the art of wood engraving, a change for the better too, as the photographed designs will demand more artistic capability on the part of the engraver than designs drawn in the present manner on the wood obtain.

In analysing the effects of the action of the atmosphere upon milk, it is found that it absorbs oxygen and gives off carbonic acid, the volume of the latter gas being much greater than that of the oxygen absorbed; this exchange takes place very rapidly after the first four-and-twenty hours, so that milk in contact with a volume of air greater than it own bulk absorbs all the oxygen in the course of three or four days. M. Stoppe concludes that there is formed at the same time compounds richer in carbon and in hydrogen. To determine their nature, he took two portions of the same milk; the one was mixed with alcohol and analysed immediately; the other was not analysed until several days afterwards; the result of these experiments, many times repeated, was:—1st, that the milk exposed to the air left considerably less solid residue than the same milk fresh; 2nd, that the milk that was exposed to the action of the air was comparatively richer in fatty matters than the milk to which alcohol was added, and immediately analysed.

Dr. Ozanam has published the conclusions derived from his researches upon the action of chemical agents upon the false membrane that appears in croup and diptheria. He studied, in succession, the action of pure water, of bromine, chlorine, iodine, bromide of chlorine, chloride of iodine, sulphuric, phosphoric, hydrochloric, hydrofluoric, and citric acids, the juice of lemons, potassa, soda, ammonia, baryta, lime-water, chlorate of potassa, perchloride of iron, bichloride of mercury, &c. Those that are really efficacious, divide themselves, according to their action, into two classes, solvents and alterants. The principal solvents are:—the *mother waters of soda*, which effects a complete solution in two hours; *soda* softens the membrane in a quarter of an hour; *bicarbonate of soda* effects a complete solution in twelve hours; *urea*, a perfect solution, leaving no traces in twelve hours; *cyanide of potassium*, complete diffusion in fifteen hours; *glycerine* softens almost to complete solution after four-and-twenty hours; *lime-water*, softens and breaks up the membrane after twelve hours, and effects complete solution in twenty-four hours; *bromide of potassium*, complete solution after twelve hours; *subcarbonate of potassa* softens and renders transparent after twelve hours; *phosphate of soda* softens considerably in twelve hours, and effects a solution in three days; *chlorate of potassa* effects solution after three or four days.

The principal alterants are *iodine* which hardens the membrane like a piece of leather, in an hour; *perchloride of iron* hardens it in twelve hours; *bichloride of mercury* hardens it very rapidly; *chlorate of potassa* slightly hardens it. Mr. Ozanam has forgotten to try Peligot's solvent for vegetable cellulose, the cupro-ammoniacal liquor. From these researches it will be seen that the most efficacious agents are those which nature has supplied the most abundantly:—sea-water, carbonate of soda, and, lastly, glycerine.

A new preparation, to which the name *heveone* is given, to indicate that it is obtained from caoutchouc, extracted from the *Hevæa guyaniensis*, and prepared under very high temperature, is proposed by M. Mathieu, a surgical instrument maker, as a vegetable *grease* for lubrication and other purposes. This substance possesses some very remarkable properties, and will render great service to numerous branches of industry. It strongly adheres to the surface of the substances to which it is applied; it never becomes oxydised under the influence of atmospheric agency; it renders unoxydizable, and preserves from rust articles of iron, steel, and copper, or in fact any polished metal, when they are covered with the thinnest possible film of *hevone*. Surgical instruments, domestic utensils, machines, arms, weapons, tools, can be kept always bright and clean. The lubricating properties of *heveone* are still more remarkable; applied to pistons, axles, hinges, screws, or other things submitted to friction, it renders their action much smoother, and it never loses its viscidity nor becomes dry, nor oxydizes, nor combines with the metals to clog the bearings. Heveone being impermeable to water, powerfully contributes to preserve intact and clean objects manufactured in leather, as boots, and shoes, harness, pulley-bands, &c., it protects them from the extremes of humidity and dryness, making them very supple and preventing decay. Its salutary effects extend also to wood exposed to the weather, as in gun-carriages, &c. Lastly, a very valuable quality for firearms, that of rendering them much easier to clean, and also to require cleaning less frequently.

The spontaneous change forged and rolled iron undergoes when submitted to continuous vibration, is productive of such critical danger, especially in the case of railway machinery, that an investigation into the best means of remedying the resulting evils, has been viewed as an engineering question of vital importance. Among others, Mr. Schimmelbuch, of Liege, has undertaken the subject, and the following is an epitome of his investigations. A bar of pure unalloyed iron was struck by a hammer three times in a minute for six consecutive weeks, at the expiration of this time it broke into three pieces. Before the experiment the bar was a good specimen of fibrous iron; after, on the contrary, its fracture exhibited a brilliant crystallized structure, resembling that of antimony.

A bar of iron alloyed with nickel, submitted to the same treatment, underwent no change.

A very simple means exists of recognising this changed condition of iron, so dangerous in its consequences. Pure iron, when magnetized by contact, loses its magnetic properties immediately the needle is detached. On the other hand, iron combined with minute quantities of some foreign body, such as carbon, oxygen, sulphur, or phosphorus, remains magnetised. The efficacy of this simple test has been established by repeated experiments.

Specimens of iron alloyed with carbon, manganese, zinc, cobalt, tin, chrome and nickel successively tested, show that nickel is the only one that can be adopted commercially to correct the tendency to crystallize in pure iron, which it is so desirable to overcome. The quantity of nickel required to produce the desired effect varies between 1 per cent. and the $\frac{2}{1000}$th part.

Mr. Schimmelbuch's experiments were directed chiefly to studying the effects of the addition of the mineral *wolfram* to pure iron. This addition imparts the greatest hardness tenacity, and density to the iron; invaluable qualities in axles of machinery, locomotives, steam-boats, and in steam-cylinders, light cannon, &c. The most inferior kinds of iron acquire an extraordinary tenacity, and a hardness superior to that of cast steel, by the addition of 2 to 5 per cent. of this mineral, according to the quality of iron employed.

Phosphoric or sulphuric iron become very tough and strong by the addition of $\frac{1}{2}$ to 1 per cent. of wolfram, and 3 to 5 per cent. renders it extremely hard. Iron thus treated does not lose these qualities even after a second or third fusion, and the castings are free from bubbles.

The addition of wolfram to copper and its alloys exercises the same beneficial action. The addition of one-half per cent. imparts great tenacity; whilst 2 to 4 per cent. renders the copper very hard, without in the least diminishing its tenacity.

The most important consequences to engineering science will doubtless result from these and other investigation, conducted with the same object.

M. Pisani has communicated to the *Academie des Sciences* a new paper on certain reactions of the salts of iron, uranium and alumina, and on the separation of uranium from iron. Hitherto we have almost exclusively attributed to the non-volatile organic acids, such as tartaric acid, the privilege of preventing certain reactions by their presence: but it has been recently observed that oxalic acid, in certain cases, acts in the same manner: for, as was stated in our last, its presence prevents the blue precipitation of the salts of iron by yellow prussiate of potassa. The following are some analogous facts observed.

Salts of Iron.—If oxalate of ammonia be added in excess to a salt of iron at its maximum neutrality, then acetic acid be added, the solution retains its yellow colour, and does not redden, as usually happens, in consequence of the formation of acetate of iron. In this same solution phosphate of soda does not precipitate phosphate of iron, but ammonia and sulphide of ammonium separate the whole of the iron, as usual. If, instead of acetic acid, we employ acetate of soda, the liquor no longer becomes coloured, but then it precipitates by phosphate of soda. To produce these reactions, as much oxalate of ammonia must be added to the solution of the salt of iron for its yellow hue to change to greenish yellow.

Salts of Alumina.—Alumina, in presence of a great excess of oxalate of ammonia, is not immediately precipitated by ammonia and sulphide of ammonium; but in a short time, according to its proportion, it is precipitated, especially with the aid of heat. We can also, with phosphated alumina, recognise phosphoric acid in this solution by a salt of magnesia; but this method cannot be recommended, for it is probable that it is precipitated as soon as the alumina. Thus oxalic acid plays only but for a short time the part of tartaric acid with the salts of alumina.

Salts of Uranium.—Nitrate of ammonia, in presence of oxalate of ammonia, is not precipitated red by yellow prussiate of potassa. It is precipitated by phosphate of soda in an acetic liquor; but if oxalate of ammonia be previously added to this solution, the phosphate of soda gives no precipitate as in the case of the iron. If ammonia be added, all the uranium is precipitated in the state of phosphate; but if phosphate of soda be not added, the precipitation of the uranium by the ammonia will be incomplete, and to precipitate the remainder phosphate of soda must be added.

Separation of Uranium from Iron.—When carbonate of ammonia is employed, as usual, to effect this separation, it always dissolves a little sesquioxide of iron with the uranium. Yet there is a way of perfectly effecting this separation—as the oxalate of uranium in solution in the carbonate of ammonia is not precipitated by sulphide of ammonium, it is only necessary to add to the liquor separated by filtration with the oxide of iron, some drops of this latter re-agent to eliminate the little iron that has been dissolved in the state of sulphide. After another filtration we have a liquor containing all the uranium without any traces of iron.

The preservation of organic alimentary substances is a matter of great importance, and numerous ingenious processes have been suggested from Appert down to Chollet, which accomplish the desired object more or less effectually, by means of excluding the air, dessication, &c., at the same time it is felt that there is a degree of complication in all these processes which creates great expense, and militates against their general adoption. A new process consists in causing the surface of the material to be preserved to imbibe and become thoroughly penetrated by a substance which possesses the advantage of being itself alimentary, and of having an agreeable taste, which can be taken in considerable quantity without causing any derangement of the stomach, similar to that caused by salted provisions, while at the same time it possesses the advantage of being very abundant and cheap. This substance is sugar, or rather a residue of its manufacture, viz., molasses. It is employed in the following manner:—The meat to be preserved is cut into slices, or portions of moderate size, and immersed in molasses of ordinary density, such as is delivered at the sugar-bakers; that sold retail is frequently adulterated, or weakened by the addition of water. By the natural phenomena of endosmosis and exosmosis, a balance is soon established between the greater density of the molasses and the weaker liquids contained in the meat, so that in the course of time the molasses acquires a certain degree of limpidity, which is a sure index of the meat having become completely penetrated by it, which is effected with more or less rapidity according to the thickness of the pieces. When the operation is completed, the meat is withdrawn from the molasses and washed in plenty of water, suspended in a current of air, and left to dry spontaneously. Meat prepared in this manner can be packed in boxes and casks, and sent to any distance without undergoing any deterioration.

It has been observed that chloride of lime kept in a bottle for some time undisturbed, is liable to spontaneous detonation: this phenomenon is explained thus:—The chloride of lime being always moist, decomposes water, especially under the influence of the solar rays, and liberates oxygen. This decomposition proceeds very slowly, until the moment arrives when the excess of oxygen breaks the bottle with violence. To avoid this accident is is only necessary to open the bottle occasionally.

An interesting reaction takes place when pure dry hydrogen and the vapour of perchloride of phosphorus ($Ph\,Cl^5$) are passed together through a glass tube heated to redness. Under these circumstances we observe the formation of hydrochloric acid gas, and liquid protochloride of phosphorus ($Ph\,Cl^3$). At the same time a certain quantity of phosphorus is set at liberty, disengaging a gas which burns with an emerald green flame, and producing white fumes of phosphoric acid. This is a mixture of gaseous phosphoretted hydrogen and excess of free hydrogen. Oxygen, at the temperature of a dull red heat, also acts upon the vapours of perchloride of phosphorus. The reaction is accompanied by a vivid light. In this case there is a considerable disengagement of chlorine: the tube retains the woolly flocks of anhydrous phosphoric acid, which gradually attack the glass in the parts heated to redness. In the cold receiver a liquid is condensed which is coloured yellow by the chlorine it holds in solution. This liquid, distilled after being agitated with mercury, becomes colourless, it is oxychloride of phosphorus. ($Ph\,Cl^3\,O^2$).

This, in M. Baudrimont's opinion, is the first instance of the direct substitution of free oxygen for combined chlorine. Perchloride of phosphorus also gives rise to a reaction when put in contact with chlorate of potassa. When three equivalents of the perchloride are mixed with one equivalent of the chlorate, both in a state of powder, a liquified mass is obtained, the temperature rises, hypochlorous gas, then chlorine, are disengaged. The residue of the reaction is chloride of potassium in supension in oxychloride of phosphorus. No reactions like the above-mentioned take place when nitrogen is operated with.

PHOTOGRAPHY IN GERMANY.

Elberfeld, Jan. 23rd, 1861.

Mr. Hardwich's opinions. expressed in the "Photographic Comments, No. XVI." of your Liverpool contemporary, differ in some points from those of many photographers. The alcoholic collodion has without doubt a decided advantage over the ethereal, provided it be composed of pure chemicals and in the right proportions; then it is stable with every iodide.

The iodide of lithium has received an unfavourable judgement in the said "Comments," and why? Because it has reddened the author's collodion. But is this a determinating proof? Do not the iodides of ammonium, potassium, or sodium do the same? Prepared in the manner which has been indicated by Dr. Schnauss, and by ourselves, the lithium-collodion is as stable as any other collodion. There have been many hundreds of pounds of this preparation made after our own formula, which have been pronounced to possess all the favourable properties we have claimed for this collodion. It remains of a light yellow colour at least one year, perhaps yet longer; even sent to hot countries it does not change its colour; besides, it is more sensitive than any other collodion. The conditions under which a good collodion possessing any properties we like to give it, are very easily stated. Three mean points must be regarded:—

1st. The plain collodion must contain an excess of alcohol, and the pyroxyline must be prepared in strong acids at a high temperature; the collodion must contain a sufficient quantity of pyroxyline so that we are able to add enough iodide to produce a dense film.

2nd. All preparations must be perfectly pure; if not, every success is put into jeopardy.

3rd. Every iodide has the property either to redden colourless collodion, or to decolourise reddened collodion. There seems to be no iodide without effect upon one or the other, red or the colourless collodion. Most of the proposed iodides redden colourless collodion; they stand in the following order: The iodides of iron, lithium, ammonium, magnesium, potassium, sodium, zinc. On the other side, only the iodide of cadmium stands, all the bromides following in the same direction. The first-named combinations therefore have in a more or less high degree the effect of acids; the latter that of an alkali. It is a curious fact that the iodides resembling in their effects to an acid, nearly all have an alkaline reaction; the iodide of cadmium has, on the other hand, an acid reaction.

Collodion iodized by a single iodide of the first series may give good results, but never will do so for a long time; it will soon become discoloured and lose its valuable properties, *i.e.*, it will get insensitive and give hard pictures. Some persons make use of this circumstance in employing an old collodion for the reproduction of objects which permit a long exposure, as prints, drawings, &c., also for views and landscapes. Nothing can be said against this application, because by a red collodion the lights are rendered more dense in the negatives, and the shadows more transparent. But for portraiture this kind of collodion dare not be used, because it is not sensitive enough, but principally because it gives too dense lights and no half-tones. Cadmium-collodion, prepared with good and neutral plain collodion, gives opposite results, *i.e.*, weak pictures; and only after a certain time obtains the property of giving a sufficient intensity.

To make a collodion which works well soon after its preparation, and retains all the good qualities (which may be given to it by the composition and proportion of the different substances) some years without alteration, we need the mixture of some iodide of the first order with iodide of cadmium: the first one in a small excess. When using the sodium iodizer we need the addition of less iodide of cadmium, than when using the ammonium iodizer. In approximate proportions iodide of lithium demands the half, iodide of ammonium or potassium the third part, iodide of sodium the quarter of its weight of iodide of cadmium.

Sodium-collodion has now come more into use. I can recommend the following formula as being very excellent:—

Ether ·725	200 parts.
Alcohol ·815	400 „
Pyroxyline	7 „
Iodide of sodium	8 „
Iodide of cadmium	2 „
Bromide of cadmium	2 „

The pure iodide of cadmium is a very stable salt in white crystals; the powdered yellow substance commonly sold under this name should never be used.

In my last letter I spoke of a second acetate of silver bath to be used after the nitrate bath for collodion pictures; some persons have tried it and found that it possessed all the advantages claimed for it; it allows shortening the time of exposure, and produces fine transparent negatives, which may be copied in half the usual time—two properties of value in these days of twilight. Should the negative seem too transparent after fixing, a little more vigour may be given to it by a diluted solution of chloride of gold.

The acetate of silver is prepared by mixing hot concentrated solutions of acetate of soda and nitrate of silver; during the cooling the new combination crystallizes out of the fluid.

The rage for *cartes des visite* is growing over the whole of Europe, also in Germany this beautiful style of pictures is much liked. At Vienna, M. Louis Angerer, the photographer of the Emperor of Austria, has the most fame, his beautiful arrangements, consisting of the richest sculpture and finely painted backgrounds, are much praised. Messrs. Haase and Co., of Berlin, sell incredible quantities of the carte-portraits of King William I., and the Royal Family of Prussia. The *Kladderadatsch* remarks:—"About this time rages at Berlin the portrait-visite-cartomania, during which the photographers of this town generally know how to occupy themselves more profitably than the honourable public. The sun, whose powers are tasked to the utmost at this opportunity, like other ill paid *ouvriers*, determines to go gratulating her customers upon new year." A wood-cut shows the sun knocking at a photographer's door; in the left hand she holds a box with the inscription, "for cleaning the solar spots!"

Professor Ludwig, of Jena, a distinguished chemist, has stated the recent analysis of "Encre photographique." It consists only of nitrate of silver and potash. In the last number of *La Lumière*, M. Gaudin hopes the analysis has not been executed upon the right "encre;" but I can certify this, because I myself bought the analysed sample of the known "Société."

The "Association of German Photographers" is always increasing, so that two new districts have been founded this month at Augsburg, and at Flensburg, in Sleswick. Under the recently joined members are Mr. Radl, one of the first German photographers of Augsburg, Count du Ponteil, a dilletant of Munich, John Sholto Douglas, Esq., of Thüringen, and Mr. Maar, Director of the Albrecht-Dürer-Association, of Nürnberg. A special periodical only for the members of this society appears now under the title of the photographic salutation, "Good Light!"

PAUL E. LIESEGANG.

COAGULATED ALBUMEN.

DEAR SIR,—If Mr. Sebastian Davis will attentively reread my letter, he will find that it has no relation whatever to the temperature at which albumen will coagulate; I simply mentioned 165°, as it would not admit of cavil, but still being 15° *below* the temperature to which he had submitted his plate. In his reply (which is *no answer* to my letter) Mr. Davis says:—"In my experiment the albumenized plate was heated and dried simultaneously at 180°, so that both the structural and chemical properties of the film *must have been altered by the process of coagulation.*"

Will Mr. Davis allow me to say, that the words I have put in italics are only *assumption*, as he proceeds to say,—"that the thin layer of albumen resting upon a collodion film can thus be entirely converted into its insoluble state, *may fairly be questioned;*" but even giving him the benefit of his own belief, that it is "*partially coagulated*," was he warranted in saying that his experiment seemed to contradict Dr. Riley's theory? Mr. Davis's albumenized plate was either coagulated or not; if *not*, it had nothing to do with Dr. Riley's experiment; and if it be questionable whether it was not a *mixture* of coagulated and dried albumen, it had still nothing to do with the question, as Dr. Riley's was *wholly coagulated.*

The erroneous notion, to which I sought to draw your attention, was the supposition that *heating and drying* the plate *coagulated the albumen.* I sincerely trust that Mr. Davis will not suppose my remarks had any *personality* in them. The question, whether the film of albumen can be coagulated by *drying the plate* at any temperature, however high, is of too much importance to be passed over slightingly; and I am very sure it cannot be left in more able hands than Mr. Davis's, if he will but experiment upon the subject without any bias.—I remain, dear sir, your sincere well-wisher, G. P.

SIR,—Mr. Davis, in your last number, has strangely misunderstood the letter of "G. P." in your journal of the 18th ult. "G. P." does not raise the question as to the degree of heat necessary to coagulate albumen, but whether drying an albumenized plate does not simply dry the albumen instead of coagulating it. The opinion that it is coagulated by dry heat is the erroneous idea which he draws your attention to.—Yours, &c. FAIRPLAY.

Lewisham Road, January 28th.

THE LONDON PHOTOGRAPHIC SOCIETY.

PROGRESS *versus* CHANGE.

SIR,—While entirely coinciding with the views expressed by "Progress," I think we cannot be too careful that our society does not degenerate into the gossiping-club style, of which we obtain a glimpse in the letter elicited from "A Former Member." What with "gossip and chat" they doubtless are, as he says, very "merry and happy," and it would seem they only need add "pipes and baccy" to complete their felicity.

No doubt our machinery is too heavy and stately, and not elastic enough for these latter days, but we cannot afford to throw overboard names which give weight to the society. Also a due amount of "ballast" gives security, and though without it we might attain to a greater speed, we should jolt considerably more. Above all, beware of the danger of *changing King Log for King Stork.*

I think with "Progress" that there should be a kind of "upper house," to which all those who have done good service, and who cannot be expected to devote their time to the details of business, should be promoted: and that a practical, energetic executive should carry on the government. The functions of secretary and editor should be divided, and the editorship of the *Journal* of the society put into more active and spirited hands. There should also be an inner circle of members, beariug some title as distinctive as the R.A.'s of the Royal Academy. The number should be very limited, and none eligible for election who had not distinguished themselves in some way—either in the practice or theory of the art—and who might thus write F.P.S. after their name, with as much laudable pride as an F.R.S. Funds—those sinews of war—would not be wanting if the society was really felt to be a fostering *Alma Mater.* I do not believe, if the subscription were doubled it would be begrudged, if it really fostered talent and the money was well spent. The annual subscription to the Geological and other societies is £3 3s. The Photographic Society should not be poorly cramped in that particular. It should possess real power—power to act, power to complete and carry out what individuals cannot, remembering that union is strength. It should be the arena into which every aspirant might throw himself with confidence; but, as at present constituted, let him beware of the cold shade of the society.

Hitherto, the photographer's has been such an anomalous position, too often a by-word synonymous with charlatan, quack, &c., that men have been fain to drop the appellation in private circles; but the time has come when they ought to remember the old aphorism, "respect yourselves, and others will respect you."

Let the society assert itself—let its members raise their standard, intellectually and practically, and they will draw a broader line of demarcation than can be done by any petty exclusiveness. Let there be some better system organised respecting the reading of papers before the society, to insure that the papers themselves are not the tedious "twice-told tales" we are too often called upon to endure. Let it be remembered that it is a place for the advancement of the art, rather than of the individual—though the latter will come as a concomitant, if not sought as an end. Let them remember it is not a place fer the flippant discussion of trade merits—not a place to puff their wares; and the society may one day rank with any other of the learned societies.

REAL PROGRESS.

Talk in the Studio.

Artistic Photography.—Our talented contributor, Mr. A. H. Wall, who for some years past has been a partner in the photographic firm of Cotton and Wall, in the City, has just dissolved connection with his late partner, and is about opening an establishment for the prosecution of artistic photography, and colouring for amateurs and the profession, in Old Bond-street.

Architectural Photographic Association.—An interesting lecture was delivered on Tuesday evening by E. J'Anson, Esq., on the "Photographs of French Renaissance Architecture." The lecture was more essentially on the Renaissance Architecture than on the photographs, which were used to illustrate the subject. In some cases where photographic specimens were wanting, drawings were substituted. In the majority of these cases, notwithstanding that the drawings possessed considerable merit, the superiority of photographs for architectural illustration was strikingly manifested.

Ethno-Photographic Gallery.—A gentlemen writing to the *Athenæum* points out the importance of applying photography to the preservation of Ethnographic records. He says:—"Great and interesting changes, of which no exact record is kept, are taking place in the condition of the human family in every part of the world. Some races of men are dying out before our eyes, and others becoming greatly modified by a variety of circumstances. English, Scotch, and Irish are becoming one people by intermarriages, and we are all gradually changing by the influence of civilization. Locomotion is mixing races everywhere in both the Old and New Worlds; soon a pure race will (if not already) cease to exist. The Red Indian is fading away rapidly; the Anglo-Saxon is undergoing a great modification in North America. Everywhere faces and forms, of which the ethnologist would long to preserve authentic memorials, are becoming extinct: any likenesses preserved are but rough inexact sketches. Is it not desirable, now that in photography we have means to do something to provide for ourselves, and to hand down to the future ethnologist the exact features and form of head, at least, of the leading races, sub-races, nations as they now exist? Would not an ethno-photographic portrait gallery, exhibiting the face and forehead in one view, and the profile and rest of the head in another, with a record of a few measurements, be of great value to those who desire to study the questions of race as well as of great general interest? How valuable are the exact and reliable sketches in M'Kenny's "Races of Man;" and how very interesting was the clever sketch in *Punch's* "International Race of 1851." If you think this a suggestion of any interest, I should be glad if you would bring it before your readers. It would be a formidable undertaking, but not beyond the power of rich and enterprising England.

A Photographic Banquo.—A certain small photograph, about the size of our visiting cards, of which strange tales are told, is now selling in large numbers all over Italy. It is the portrait of an Italian soldier, who having attempted the life of the king was cruelly executed. For some time previous to his downfall, it is said that this photograph, like Banquo's ghost haunted the tyrant. Mysteriously enough, and in defiance of all precautions, it is said to have met his eyes at all hours and in all places, until there seemed something supernatural and ominous in its ever recurring presence. When he knelt before the Virgin's shrine, in his morning orisons, there, about the neck of the image, hung this photograph. When he attended mass and opened his missal, there was the soldier's portrait. At dinner, when he unfolded his napkin, out fell this identical photograph, and when at night he retired to rest, within the well-guarded sanctuary of his slumbers, there, laid boldly upon the very pillow of his couch, he found this picture, this strange production of an art which he had banished from his crime and terror-haunted dominions. A Garabaldino, whom we have just welcomed back from his generous and dangerous labours in behalf of an enslaved country, showed us the portrait, and said it was thought in Italy that the king's singular flight from an enemy quite unable to compete with his well-organised and far more numerous forces, was to some extent attributable to the state of bewilderment and terror brought about by these unaccountable incidents. Be this true or not, certain it is that in consequence of the interest thus attached to the photograph in question, it is rapidly selling all over the newly liberated country. Most of the English Garabaldini have brought over one or more.

To Correspondents.

Stereoscopic Exchange Club.—A correspondent writes to say that he forwarded pictures for exchange to two members of the Exchange Club, to one on the 27th of November, and to another on the 17th of December, without yet having received any return. Where members have not a supply of specimens already printed, the recent weather may have operated as an insuperable barrier to the prompt return of exchanges. We should be sorry to think that any want of confidence in each other was arising in the minds of members. Where suitable pictures for exchange are not in hand, and the state of the weather precludes their preparation within a reasonable time, we would suggest that an intimation of the fact by post would be desirable. *Verbum sap.* Our correspondent adds, that except in the instances he names, he has been much gratified by his exchanges.

B. W. R.—We have more than once given an opinion on Dr. Hill Norris's Instantaneous Plates. So far as our experiments have gone they fully meet the conditions claimed for them; but they require great care and cleanliness in manipulation. The photographic ink we have never tried. The analysis of Dr. Schnauss, given by our German corresponpent, stated it to consist simply of an adulterated solution of nitrate of silver.

Prendergast.—The advantage of using a portrait lens in the magic lantern is in the superior definition obtained. The disadvantage of the image being generally small. See the letters in another column.

J. P.—Under-exposed pictures fog frequently in developing, because the free nitrate of silver is reduced by the iron solution before the latent image is developed. The condition of the nitrate bath, of the collodion, and of the developing solution, may all tend to bring about the same result. If the collodion be new, or the bath or developing solution deficient in acid, the tendency to fogging from under exposure is increased. A little longer exposure, more acetic acid in your developer, or the use of an older collodion are the best remedies. The addition of a little tincture of iodine, or of hydrobromic acid to your collodion will sometimes have a similar effect as age upon it.

R. C. R. B. J., India.—1. There is no remedy for your pictures being out of focus, but more careful manipulation; unless indeed, the lens or camera be at fault. The specimens you send appear tolerably sharp, but require more carefully lighting. There is too much top light, giving heavy shadows under all the features. You will get more half-tone, by the addition of a bromide to your collodion, about half a grain to the ounce. The pin holes may proceed from dust, or a turbid bath, or a very old bath, or from the collodion not being quite settled. 2. The defects you mention in your collodion positives appear to arise chiefly from the use of an unsuitable collodion. Varnishing will improve them. 3. The prints have the appearance of having seen the light either before printing or toning, or the paper may have been excited a few days. Take great care that the paper is not exposed to any white light except such as passes through the negative, and let the printing and toning succeed the sensitizing as rapidly as possible; use the alkaline gold toning process and fix in new hypo. 4. For dry plates try the collodio-albumen process. You will find formulæ for collodions and for various developing solutions repeatedly given in our pages. You will find many excellent processes collected and carefully stated in the Photographic News Almanac for this year. Mr. Cramb has not yet published his formula, but you will find a formula for the albumen process in the present number.

M. M. D.—The chloride of gold should be neutral; not so much because it will give better tones; but because there will be less danger of the toned print decomposing the hypo fixing solution. It is an excellent plan to make every 15-grain bottle of chloride of gold at once into a solution of, say 15 ounces, and keep it so for use, neutralizing it at the time. Most commercial samples will probably require from half a drachm to a drachm of carbonate of soda to neutralize it. Test with litmus paper.

Un Pauvre Homme.—Your glass specimen was smushed beyond the possibility of forming any idea of its quality. The defects to which you refer in the eyes, are probably due to your inefficient mode of lighting. For successful portraiture a properly lighted glass-room is indispensable. The next best method of lighting is in an ordinary room with a large bay window facing north, and using reflecting screens. Applying black varnish to the collodion film is a sure method of spoiling a collodion positive.

J. C.—You have added too much acetate of soda to your bath, which became surcharged with acetate of silver. The crystals reappeared because you had neutralized the nitric acid. Excess of acetate of silver has a tendency to produce fogging, especially with an iron developer. We prefer to neutralize nitric acid with oxide of silver, and avoid acetate of silver in the bath, where it can be dispensed with. 2. For the Fothergill process one of the first requisites is a suitable collodion; one containing a bromide is best. Ponting's collodion has a high reputation for the wet process, but we believe it is not very suitable for the Fothergill process. *Ackland's Hints on the Fothergill Process* contains some excellent advice. 3. To recover the silver from clippings, filter papers, &c. burn them in a crucible with equal parts of carbonate of potash and carbonate of soda. See articles on "Photographic Chemicals" at present in progress. Transparencies may be printed by the wet process in the camera, or by the dry process by superposition. The latter is the best if you are practised in a dry process. They may be toned with gold. See article on the subject shortly.

A Bungler.—The process for producing yellow negatives, recently given, is very simple. You have probably attempted it with one solution not properly prepared. First, whiten with a solution of bichloride of mercury, 20 grains to the ounce, and then wash well. Next apply a solution of iodide of potassium, three or four grains to the ounce, which will turn the whitened picture yellow. Your silver solution is spoiled by the hyposulphite of soda. You must now simply recover the silver by the process given in articles on "Photographic Chemicals," which we are at present publishing.

E. A. H.—Inhalation of the fumes of cyanide is decidedly prejudicial, and should be avoided. Hyposulphite of soda may be used for fixing positives, but cyanide generally produces a whiter tone. The operating room should always be kept as well ventilated as possible, as inhaling the fumes of many of the chemicals is unwholesome.

M. A.—A new edition of "Hardwich's Photographic Chemistry" will be ready very shortly. It will, doubtless, be advertised in our columns when out. Common washing water may be kept in an unvarnished barrel, and an ordinary brass tap may be used. Distilled water is best kept in a large stoppered bottle. We shall have pleasure in receiving a communication on the subject you name.

Insensitive and others next week.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 127.—*February* 8, 1861.

THE PHOTOGRAPHIC EXHIBITION.

Portraiture.

A noticeable circumstance in connection with the present Exhibition, is the absence of specimens from many of the best known portraitists and former exhibitors, Williams, Mayall, Kilburn, Hennah, Herbert Watkins, Silvy, and some others who enjoy a high reputation for this branch of photography, and who have on former occasions contributed to the Exhibition, more or less largely, are this year "conspicuous by their absence." The first two gentlemen, perhaps, are scarcely correctly included. Mr. Williams has sent recently, some time after the Exhibition was opened, two or three vignettes of children, which are very pretty, but scarcely up to the specimens of former years, and Mr. Mayall has contributed the series of album portraits of the Royal Family, with which the public is familiar.

One of the first reflections which occur to us after an examination of the portraiture here, is that this most universally interesting and most largely practised branch of our art, at least amongst professional photographers, has not progressed in nearly equal ratio with some other branches. The portraits generally, do not strike as better as a whole, than they were several years ago. There is not a frame now exhibited of better pictures, in every sense of the word, than Hennah exhibited half-a-dozen years since, whilst we scarcely remember to have seen any exhibition with such a prevalence of good landscapes. We scarcely know to what this may be attributable: whether portraiture attained its maximum of excellence earlier than landscape photography, or whether having attained a certain status, the commercial exigencies of the profession have maintained it at the dead level of goodness which it had attained, without attempting to take it higher, or whether the best pictures have not found their way to the Exhibition, we cannot quite pretend to say. There are certainly many excellent portraits, some few very good indeed; but we cannot help thinking that we have seen a great many better than those which form the staple at present in Pall Mall.

One consideration we cannot forbear suggesting as a possible reason why portraiture generally has not progressed in equal ratio with landscape photography. It is that many portraitists, confessedly, "have not time to read the journals," and think they know all that need be known about photography, without bothering themselves with new ideas. We are, possibly, scarcely unprejudiced in our judgment, but we think they are guilty of a most suicidal error. We were amused with an illustration of this idea we heard the other day. One of our most esteemed and illustrious photographic chemists was recently staying for a short time in an obscure rural village, when circumstances threw him into contact with a peripatetic photographer, who was taking cheap glass positives of the rustic Chloes. The pictures were fogging very much; and the *savan*, with the courtesy which characterizes him, asked some questions with a view to helping the portraitist out of the difficulty. The reply was discouraging: "Oh! that was all right enough; it would brush off when the portrait was dry!" To shorten the story, the operator had been a photographer fifteen years; he thought he knew a thing or two; but never read the journals; not he. He was quite content, after fifteen years' experience to take cheap glass positives, the fog on which might be brushed off when it was dry! We only give this as an extreme instance to illustrate our suggestion.

To return:—Another noticeable omission, and we must confess to ourselves a disappointing one, is the absence of portraits enlarged by the solar camera. There are two or three enlarged portraits, but as to the method of enlargement, the catalogue is silent. The most prominent of these, a portrait of Lord Macaulay, we have already noticed; further examination confirms the opinion we then expressed, and the universal comment we hear is to the same effect. It is highly valuable, as illustrating how one offence against the canons of artistic propriety and good taste is sufficient to spoil much, otherwise, skilful labour. This is a portrait in which, we doubt not, the photography was perfect, and the painting is well done, yet from the enlargement being to a size just less than life, the effect given is of an insignificantly diminutive man or an antiquated boy. An enlarged head, about half the size of life, exhibited by Lock and Whitfield, and finished in black and white chalks, is spirited and effective. There are a few other enlargements, unimportant either as to subject or method. We have seen some good enlarged pictures, produced by means of the solar camera, but we are sorry that nothing of the kind is here exhibited.

If size alone were a condition of excellence, perhaps the largest portraits (not enlarged) are those exhibited by Messrs. Baugh and Bensley. It is a pity that quantity cannot be accepted in lieu of quality; where the results, however, are bad, the badness seems offensive in the direct ratio of size. A portrait of G. P. Bidder, Esq., No. 208, notwithstanding the interest which attaches to the aforetime "calculating boy," the now able engineer, is an especially unsatisfactory portrait—a full-length standing figure of an apparently somewhat ungainly person, exhibited in the most ungainly aspect. Some portraits of Mr. Webster, in the "Dead Heart," are much better, being well lighted, well posed, and generally effective. All the pictures exhibited by these artists bear evident impress of the old hypo toning, and are already somewhat yellow.

No. 8, a frame containing seven portraits by J. G. Macandrew. These are all good photographs, and apparently pleasant portraits.

No. 17, a frame containing eight portraits by C. Wright. We are sorry for this artist that his works have been praised by some of the critics; there are some indications of a desire to produce artistic pictures; but there is as yet a considerable shortcoming of all the artistic excellence of which photography is capable, there is much that is hard and coarse about his pictures; which are, moreover, sulphur-toned.

Mr. Hering exhibits some very fine portraits. There is less that is common-place about these than among many other equally good photographs; the white background is in many cases a slight drawback.

No. 138 is a portrait by the Rev. Dr. Holden, coloured by C. Burlison, artist, Durham. What a tide of recollections does the name of the painter here mentioned bring across our mind! Years before the advent of photography he was just commencing his career as an artist of high promise in our native town, and, if we rightly remember, about to start for Rome to pursue his studies, at the time of which we speak. He had commenced life as a coach-painter, and we enthusiastically believed it to be worthy of the highest ambition to emulate his example, and would gladly have stepped on to the lowest round of the ladder to follow him step by step. We love the pencil still, although our duties bring us more into the dark-room than the studio, and more to the editor's desk than either. The portrait which has recalled these memories indicates how a clever artist may make an indifferent photographic colourist; unless, indeed, the position of the picture, right down on the ground, prevents us arriving at a just judgment, notwithstanding that we have repeatedly been on our knees to examine it.

M. Claudet exhibits some very fine portraits of a large size, graceful in pose and good in execution. Messrs Caldesi and Blandford, also, have some very excellent specimens, in which, notwithstanding a little redundancy in background accessories, a decidedly artistic taste is manifested. We commend the method of mounting these portraits to the attention of photographers. About an inch of a very delicate drab surrounds the picture and gives the effect of an engraving on Indian paper. We prefer the effect of the tint here used to that of India paper proper. The tint is produced, we presume, by lithography on the mounting board.

The Rev. T. M. Raven has some very pleasing portraits and *genre* pictures, in which general arrangement, pose and expression are decidedly good. A series of portrait studies by Mr. C. T. Newcombe, are hung in a bad light, but appear to possess much merit.

"Our Charley," No. 622, London Stereoscopic Company, is a pleasing portrait of a pleasant smiling boy in a reclining position. The portraiture is better than the photography, which is just a little hard.

Mr. R. F. Barnes has a number of portraits of unequal merit; a series of studies, No. 423, are the best specimens he exhibits.

The coloured portraiture is a striking feature of the Exhibition, one end of the room being chiefly devoted to that branch, and the wholesome rule,—at one time we believe held imperative,—of insisting on the exhibition of an uncoloured duplicate of each coloured picture, appears to a large extent abrogated.

Claiming precedence as the productions of a gentleman belonging to the very foremost rank of miniature painters, are the water-coloured specimens of Carrick, of which there are about thirty, many of them large pictures. We must fairly confess we are disappointed in them. With much that is very charming, they are, at least the major part of them, flat, feeble, and insipid. There is, moreover, an unaccountable family likeness prevailing amongst the sitters that is quite unaccountable. The interest attaching to the names of the various portraits is undoubted: we have Charles Reade, Charles Mackay, Fred. Goodall, A.R.A., Samuel Lover, S. W. Carmichael, with more artists, men of letters, and other celebrities; but we cannot understand why they should all possess in such a marked degree exactly the same tint of flesh, and the same, or nearly the same, stony grey eyes. The manipulation is throughout very perfect, and much truth, delicacy, and artistic feeling pervades the pictures in many cases; the silk and satin draperies are exquisitely painted, and are at the same time quiet and subordinated; the backgrounds, in some cases, especially the sketchy landscape backgrounds in vignetted pictures, are very beautiful, and display the true artist, but the faces are flat, and deficient in modelling, and the general effect of many of the pictures is feeble and unsatisfactory.

The oil-coloured photographs exhibited by M. Claudet do not generally err in the same direction, they are mostly brilliant, and many of them are exceedingly well painted; some of them are much too pretty to be artistic, and have unnaturally blue skies, glowing draperies, and waxy flesh; in the majority, however, the painter and the photographer have combined to produce a perfect whole.

Lock and Whitfield, as usual, exhibit some exquisite specimens of manipulation in water colouring, but there is also the same tendency to a slaty tone in many cases, with the same large eyes and faultless mouths.

Gush and Ferguson have some very fine specimens of water-coloured portraits. Maull and Polyblank show some oil-tinted portraits which are very chalky and unlike flesh. Mr. D. Mossman shows a frame of coloured portraits by a process to imitate ivory; the imitation is tolerably effective and the result pleasing: the portraits are apparently on paper.

Notwithstanding many of the faults of coloured photographs, there is more good portraiture and more truth than we ever saw in an exhibition of miniature paintings. The men and women do look like men and women, and not like the conventional figures which for ages passed current for them amongst all but first-class miniature painters.

THE SCOTTISH PHOTOGRAPHIC EXHIBITION.

First Notice.

There never was a more unfavourable season for the enthusiastic photographer than the spring and summer of last year. "The rain it raineth every day" was, during the whole season, a great fact, which admitted of no dispute, except when it poured, and if, perchance, the sun ever "stopped in his course to play the alchemist," he presented such a sloppy front, and was surrounded by so many discordant elements, as to defy even an operation in wet collodion. Spring is the most prized season of the year by the out-door photographer, on account of the sharp and defined outline which every object presents in nature, and also from the trees not being so thickly clad with foliage as to hide their individual forms, or obscure the numberless flickering lights which play at hide-and-seek amongst their leaves and branches; but the "merry spring time," as it is popularly called, was dropt out of the calendar last year, and a season of darkness and gloom substituted, which set at naught the best efforts of the most accomplished photographer.

Impressed with these considerations, it was with fear and trembling that we betook ourselves to the Exhibition of the Photographic Society just opened in Mr. Hay's Rooms, George Street, Edinburgh, but a cursory glance at once dispelled our fears, and satisfied us that the display, if it did not surpass, was worthy to be ranked side by side with any of its predecessors. This may be accounted for by several of the best productions being the fruits of previous seasons. Robinson's "Holiday in the Wood," for instance, we saw in London upwards of a year ago; but however that may be, let us be thankful for the treat set before us, without inquiring too minutely into the time when it was provided. One great feature in the present Exhibition is, that it contains fewer specimens of an inferior class than on any former occasion, and in consequence the average rate of excellence is more equal and better sustained; while Robinson's two pictures of a "Holiday in the Wood," No. 65, and the "Top of the Hill," No. 27, are specimens of a class which, in artistic feeling, grouping, and composition, as well as in truthful light and shade, is entitled to rank with the best productions of modern art. It was Rejlander, we believe, who first originated the method of printing from various negatives, as displayed in his admirable cartoon of the "The Two Ways of Life," which, besides containing some thirty figures grouped artistically, was embellished with a landscape background. Excellent as that work was, it wanted the vitality and sentiment with which Mr. Robinson has imbued the present compositions, and which constitute them—works of intellect.

As the crack pictures of the season, a short account of these beautiful works may be permitted. The "Holiday in the Wood" consists of a party of ten children enjoying themselves with all the zest and glee of youth on a wooded bank; the expression and character of the children are most natural and pleasing, as they weave garlands of wild flowers, &c. In the middle distance, two little girls are advancing, one of whom carries a basket; the younger has a timid expression, which is rendered with the greatest truth, and the whole subject is enclosed in a background of trees, through which the light pierces, and gives to the composition a strong and picturesque effect of light and shade. The boy in the foreground is especially remarkable for exquisite manipulation and artistic excellence. The grouping throughout is of the pyramidal form, and the pleasing disposition and arrangement of the figures leaves nothing to be desired. Who shall say after this triumph of photography to what extent the art may be carried in the hands of a man of artistic perceptions! The other picture—"The Top of the Hill," No. 27—is not less remarkable than the preceding. It consists of a single figure, that of a girl, who stands in an easy position, with one hand on her breast—a pitcher resting on the ground at her feet. The scene is supposed to be the top of an eminence overlooking a valley in which a river flows through a richly wooded champagne country till it is lost in the far distance. The sky is without a cloud, and the open daylight effect of the whole—exquisite gradation of tints, which so admirably convey the idea of distance—and general truth and delicacy of the composition, are truly wonderful when the difficulties in representing such a subject, of which only a photographer can have a correct idea, are taken into account. It is not pleasant to make disagreeable prophecies, but as photography has already in a great measure superseded the miniature painter, the time does not seem far distant when it may probably equally affect the painter of *genre*.

In portraiture, as usual, the Exhibition is much indebted to that eminent photographer Claudet, who has led the way in carrying that branch of art to its present high degree of perfection. His beautifully clear and brilliant style, so truthful in its delicate middle tints and expression of local colour and effect, is regulated by artistic knowledge and a fine eye for the graceful and beautiful. Two of his largest portraits hang below "A Holiday in the Wood," Nos. 66 and 67. In the full-length of a handsome lady in white muslin dress, the artist has succeeded in giving the delicate shading of the white dress with all the truth and subtlety of nature. Another exquisite example of Claudet is "The Pet," No. 570, a small full-length of a young girl in a fanciful costume. This is quite a gem in its way—the perfection of photography in exquisite manipulation, texture, delicacy, and taste. All Claudet's other portraits will amply repay the most critical inspection.

Of our own artists, Tunny and Moffat take the lead in portraiture; Dallas is also very good, but too dark in colour, and consequently neither so agreeable or effective as the others. Of Mr. Tunny's portraits those of Mr. Duncan M'Laren, No. 490, and Mr. Robert Allan, No. 488, are admirable specimens. The first is one of the best portraits we have ever seen; and Mr. Moffat's Professors Christison and Syme, Nos. 552 and 524, are no less favourable examples of his talent. The portrait of Principal Brewster is also extremely good, though scarcely equal to Claudet's. The portraits by an amateur, Mr. J. Ramsay L'Amy, are amongst the most creditable things in the rooms. They are excellent in tone, colour and effect, and have a look of life about them which is very pleasing. Mr. L'Amy also exhibits several landscapes that are equally satisfactory. His coloured portraits seem good photographs spoiled—though from no fault of the painter. The beautiful small compositions of Lady Mathison are always interesting. Four small groups, No. 32 *et seq.*, are artistically disposed and executed with taste and precission. Her "La Penserosa," No. 564, and "L'Allegro," No. 576, are also happy conceptions, and well executed. The studies of Mr. A. T. Herries in Guernsey, Bruntisland, &c., are this year distinguished by greater precision than formerly. Some of them are first-rate. Dr. Walker's two studies, Nos. 304 and 305, are picturesque bits, though scarcely expressed with that completeness we have seen on former occasions. "The Greenhouse," by Mr. George Moir, No. 470, and a study of an "Old Lady," by Mr. John Cay, No. 566, though both small, are highly creditable. The Russian portraits of Mr. J. M'Gregor, No. 252 *et seq.*, do not impress us with a favourable idea of Russian beauty—they are, however, well executed; and his "Finnish Egg Women," "Hungarian Tinkers," &c., No. 307, are curious. Mr. Horatio Ross is celebrated for his love of and proficiency in field sports, and displays the same taste in his selection of subjects for photographic representation. He may be termed the Landseer of amateur photography. The spoils of the chase are exhibited in four pictures, No, 300, and very careful studies they are, though we cannot say Mr. Ross has been quite so successful in his white hares as Claudet in his white gown.

The landscapes of Vernon Heath are amongst the most attractive in the Exhibition, and bright sunny scenes they exhibit. The execution is delicate and highly finished, and the subjects well chosen and tastefully handled, but the texture in its lightness is apt to diverge into muzziness; and had the execution been a little sharper we should have considered it an improvement. Mr. T. Annan's landscapes are all exceedingly clever and picturesque. No. 276, "Aberfoyle," is complete as a picture; and No. 280, "Inversnaid Waterfall," is equally good. In winter scenes, in architecture, and in portrait, this artist is equally at home, and his works rank amongst the best in the rooms. Mr. D. Campbell is also an able photographer. His "Culzean Castle," No. 101; "View on the Girvan," No. 378; and "Craufurdland Castle," No. 398, are all excellent specimens, and highly creditable to his talent. In architecture, the "North-West Door of Rouen Cathedral," No. 283, by Bisson Freres, shows the capabilities of photography for such subjects. In detail, texture, and relief this photograph is perfectly illusory, and the ablest of artists, with unbounded time at command, might despair to reach its truth and finished excellence. —*The Scotsman.*

DIALOGUE SKETCHES.—No. 6.—At a Photographic Exhibition.

[From a "Photographer's Common-place Book."]

"What would you have me do,
When out of twenty I can can please but two?
One likes the pheasant's wing, and one the leg;
The vulgar boil, the learned roast an egg:
Hard task to hit the palate of such guests."—Pope.

At a photographic exhibition, if you please, not this, nor that, no, nor t'other; but, to "prevent mistakes," at *a* photographic exhibition.

Among the people present at this exhibition are Lovetruth, Brushart, and Process; and they are examining a large specimen, in which the photographer, with a fine feeling for the picturesque, has successfully represented the mists and exhalations of early morning, floating upwards from the shadowy depths of a beautiful valley. In the foreground, a mass of foliage just catches upon its topmost boughs and sprays the gleams of the rising sun. The morning veil reposing in dewy heaviness over all, softens outlines and details in the middle distance, and gives to objects more removed a mysterious shadowy character, full of suggestive beauty for the imaginative and poetical spectator. It has a sky, but as that sky is natural, beautiful, and in keeping, I don't care one fig how it was got. It it is numbered in the catalogue 9,899, and is, in short, the identical photograph described as taken by Newart in the first of these sketches.

Brushart.—If I am so far won over to your opinion, Lovetruth, don't be conceited, for the fact is due rather to Newart's works than your words. But although I *now* admit that photography may secure form and its actual expression, I can never exalt the grossness of the mere material to a level with spiritual refinement and ideal beauty. In a fac-simile representation of nature it is, of course, as you say, impossible to separate the soul from the body it inhabits; but in high art it is not always a soul in existence within that body which is reproduced in our painting, but a soul created by ourselves, and infused into our work as a portion of our own intellectual individuality. This it is which we recognise as high art, not exactly the perfection of the judgment, the knowledge of principles, the education of eye and hand, or the manipulatory acquirements of mere experience. Such things may be valuable as the grammar of a language, and the power to write and speak it; but the thoughts conveyed, the beauty embodied, the lessons taught, and the good done, these alone constitute art in its noblest and its highest state of progress and refinement.

Lovetruth.—Do you not see how, in making such an admission, you separate high art from the means used in its expression, and so confine it to a purely spiritual existence without language or form? It is true that the art which speaks, in eloquent language, and eloquent sentiments, the poetry of an artist-soul, must rank higher than that which merely indicates the common thoughts of common minds, in the language of vulgar life; but then, as you have made it no longer a question of the means used, he who has the mind of an artist, be he photographer, painter, poet, or musician, may have legitimate claim to the name of an artist also, even though he fail lamentably in every practical application of these high arts.

Brushart.—That claim is not legitimate until its justice is clearly demonstrated. When the lofty qualities of a master mind find expression on paper or canvass, or in the eloquence of the mighty orator, I admit the claim to distinction; but I can't praise the dumb for eloquence or admit the symmetrical beauty of a form I never knew.

Lovetruth.—Nor do I ask you to do so. If high art springs from the brain of the artist, rather than the process which expresses it, let photography be judged thereby. Here, for instance, is Newart's picture, and Newart is an artist. You will not deny that he chose this view with an artist's eye and a poet's feeling. It embodies all the thoughts to which it gave rise. It speaks to you and me, just as it spoke to him, and, therefore, may be as legitimately said to embody the intellectual emotions of the photographer's mind as any other work of art does the spiritual effort to which it owes its being.

Crackdbell (who has stolen up unobserved.)—It embodies a consumately good, practical knowledge of photographic chemistry, an excellent lens cleverly managed, a good process, delicately careful manipulation, and—*nothing else.*

Process.—Well, well, I won't go so far as that; although, of course, such things as Crackdbell names, are the most important, because it is clearly impossible to produce an artistic picture if you have a bad lens, an inferior process, or don't understand the management of your chemicals. Still I think the mind of the artist necessary to produce the highest results, although he must *first* be a good photographer. Now, look here (pointing to a photograph numbered 9,840), that's a splendid photograph, and an artistic picture to boot; but it wouldn't be the latter if it were not the former. What do you think of it, Brushart?

Brushart.—Hum! not *too* much.

Process.—Indeed! Well I am surprised! Why look how sharply defined it is even in the extreme corners, how full of detail and sharpness the distant objects are. There is nothing lost either in lights or shadows, and— but what do *you* think of it, Lovetruth? Brushart here only believes in art which is created with the brush.

Lovetruth.—It really is a most ingenious performance. The photographer must have taken an infinite amount of pains. However he contrived to get so much sharpness in distant objects confounds me—

Brushart (aside).—And ærial perspective.

Process.—Ha! ha! I thought it would please *you.*

Spectator (examining the specimen in question through a powerful glass.)—Lor! bless my heart! Isn't it wonderful! I do believe I can, through this glass, see the time at which it was taken by the clock in that very distant church tower!

Lovetruth.—How anxiously such an operator must watch for a clear and cloudless day, when the pure atmosphere is almost colourless; what faith he must have in stops, and what delicate manipulation and mechanical skill he must adopt to succeed in so wonderfully violating all the truth and beauty of nature!

Process.—Hey, what! *you* don't like it? Well!

Crackdbelt.—Like it, why how could he like it?

Process.—No, I forgot; it ought to be out of focus, like that hazy, indefinite, foggy-looking mass of indistinctness and folly you have been so comically praising for these last five minutes or more, much to my amazement and disgust; yes, disgust is the word, and so its out; excuse my bluntness.

Lovetruth.—My dear fellow, don't grow warm. We admire that hazy indistinctness, not because it indicates that the lens has been put out of focus, but because it expresses a certain atmospherical effect which we consider very beautiful. Such an effect might be out of place, and then we should condemn it, or unnatural, and then it would be ridiculous; but being both natural and beautiful we—as you say, "comically praise it."

Brushart.—Bye-the-bye; it strikes me that it would be a very effective way of securing softness, that.

Crackdbett.—That? what?

Brushart.—Why putting the lens a little out of focus.

Process.—Ha! ha! ha! I thought so.

Lovetruth.—That's a mistake Brushart, but it is one into which others have fallen. Sir William Newton, an artist and an enthusiastic lover and practiser of photography, pained by the hard unnatural effect of the photographs he then saw, could suggest no better method of destroying it than that of putting the lens just a *little* out of focus. But he knew as well as you and I that softness was a question of *gradation*, and that to put the lens out of focus was to impoverish and weaken the image; only it was the best remedy then at hand. Softness and hardness are qualities over which your lens should exercise little or no control. If I over-expose the image, I lose detail and gradation, and gain hardness. If I over-develope, I do the same thing. Some collodions won't give softness, some developers destroy it. In brief, we have so much control over our practical appliances that for every bad picture I hold its producer alone responsible.

And so they pass on to other pictures, criticising and arguing as they go.

Spectator No. 1, (coming up to Newart's picture).—What a wretched thing. Let's see, (looking at his catalogue) No. 9,899—Newart—Yes, a very poor operator, his productions are so very inartistic.

Spectator No. 2.—Yes, truly! what a pity these photographers are not artists. *That's* about the only artistic picture in the room, (pointing to 9,840).

Spectator No. 3 (*examining* 9,840).—Ah! you see, very beautiful as a photograph—*very*, but just imagine what a painter would make of such a scene. We should not have in his productions this hard flat effect—this want of space and air—this uninteresting monotony of subdued tones—this harsh hardness of lines and horrible distinctness of detail.

Spectator (No. 3's companion).—Ah! but you mustn't compare photographs with paintings, you know; it is not fair to do that. Of course they have their value, and in some branches that value is really very great, but they can never rank with works of art. Why, bless you, my chimney-sweep* takes photographs now, and very nicely he does them too. I gave him the ridiculous sum of fourpence for a picture which my wife prefers to one which cost me a guinea.

Spectator No. 4.—Ah! effect of morning mist. Beautiful, beautiful, very beautiful!!

In publishing the last of this series of "Dialogue Sketches," permit me to add a few remarks in my own person. These motley papers of mine have advocated a much neglected branch of the photographic art; and in these sketches, I have particularly endeavoured to draw more closely together the ties which unite the photographer and the artist, confident that their union must benefit both. In earnestly advocating the artistic in its practical application to photography, I have only endeavoured to give it a fair amount of importance in its relationship with all the other branches of photographic art and science; and let no one imagine that I have attempted to elevate one by the degradation of another. I introduced Lovetruth and Newart to personify the photographic-artist and the artist-photographer; Brushart to represent those critics who believe in no art but their own Process as the advocate of "purblind practice" and mechanical photography; Snailowl as the old-fashioned—if I may use such a word in connexion with so new an art—the old-fashioned photographic conservative, precious slow in his progress, and anxious "to keep it dark;" and Crackdbell, whose name the following lines will give good reason for, because he

> "Like a bell that *time* hath crack't,
> Which by this certain mark is known,
> His speech is clatter without tone."

My Common-place Book will find me other papers or other texts; but for a few weeks to come I shall confine myself to a series of articles, which I trust to render of good practical service to all who are desirous of blending the artistic with the scientific in their photographic manipula-

* See "Talk in the Studio," vol. v. p. 48.

tions. I refer to the "Technology of Art," now in the course of publication. Good artistic pictures will do more to elevate our art in public estimation than all the writing and talking of our journals and societies, although to that talking and writing, if we are only practical, such results may be primarily due. I have, therefore, much pleasure in adding my mite in the the cause of artistic photography. A. H. W.

Scientific Gossip.

Some comparisons of the relative intensities of the moon with Jupiter, Venus, and the sun, have recently been made by Professor Bond. He has found that the light of Jupiter seen from the earth at its mean opposition is to the light of the mean full moon, as 1 : 6430. Compared with the light of Venus at its greatest brightness it is as 1 : 1·4864. Thus the moon is equal to 6430 Jupiters, all shining in the heavens at once, whilst it would require nearly 1½ Jupiters to produce a light equal to that of Venus. Comparisons between the brightness of the sun and moon had previously been made by Bouguer and Wollaston; the former found that one sun was as bright as 300,000 full moons, whilst Wollaston considered that it required 801,072 full moons to equal the sun in brilliancy. The preference has generally been given to the latter. Professor Bond has just completed a series of experiments on this subject, and adduces several reasons for considering Bouguer's method of observation to be the best of the kind, and his results deserving of most confidence. Amongst other experiments tried by Professor Bond was one in which comparisons by means of Bengola lights, were made between the images of the sun and moon reflected from a silvered globe. This gave the value, sun=471,000 moons. Other methods less reliable also tend to confirm Bouguer's determination These results will serve to convince photographers of the hopelessness of attempting to take photographs by moonlight, as we know has more than once been attempted and frequently proposed: for taking that measurement which gives the least difference between the sun and the moon, and supposing that a sensitive collodion film only required one second's exposure, it would then require to be kept in the camera, looking at the landscape, for 300,000 seconds, or upwards of 83 hours. And not only must the 83 hours be only moonlight, but it must be that of the *full* moon shining on the object under the most favorable circumstances.

In a former "gossip" we gave an account of an apparatus made by Mr. Gassiott for the purpose of producing light without any accompaniment of heat, by means of an induced current of electricity, and suggested the employment of this kind of apparatus for surgical operations, &c. We are glad to see that Mr. W. Hart, a surgical instrument maker of Edinburgh, read a paper on this subject at the last meeting of the Royal Scottish Society of Arts, and exhibited the instrument before the meeting. The arrangement consisted of a small Ruhmkorff's coil machine capable of working with a small battery, and transmitting electricity through narrow glass vacuum tubes, bent near the middle until the ends come nearly together. When a stream of electricity is passed through one of these tubes from the coil, especially if the tube contains a rarified medium of carbonic acid gas, a stream of constant and mild light is emitted from the tube, which can be introduced into any cavity or recess where light is required, and observations can be made and operations performed without interruption from the shadow of the operator, and without the use of reflectors. The value of this light is greatly augmented from the fact that there is no danger of scorching the patient, as there is no perceptible degree of heat resulting from its use. These tubes can be constructed of almost any shape and size, according to the nature of the operation required, and the colour of the light can be adapted to the same object according to the character of the gas introduced into the tubes. Two small Bunsen batteries are sufficient to produce a light sufficient for all ordinary purposes. To the photographer this new light is of almost as much importance as to the surgeon The number of actinic rays it contains is something astonishing, being almost equal to the flame of sulphur burning in oxygen. There is no difficulty whatever in arranging the light; in fact, when once the instrument is adjusted the light manages itself, and will keep glowing night and day without attention, so long as the battery power is maintained. The expense at present would be undoubtedly considerable, so much so, in fact, as to entirely preclude any but the very wealthy from employing this means of night illumination; but in this it only shares the same fate with most novel discoveries; as soon as public attention is directed to the many advantages to be derived from "cheap electricity," there will be no lack of companies to supply the want, or of experimental and mechanical ingenuity at the service of the companies. The means of obtaining cheap electricity do exist, they only want economical application on the large scale.

The beautiful method of spectrum analysis, to which attention has recently been drawn by MM. Bunsen, and Kirchhoff, seems to be producing good results. A short time ago we had to announce to our readers the discovery of a new metallic element by its means, and we have just now heard that another metal has been added to the number. Messrs. F. W. and A. Dupré have found in some deep well water of London a fourth member of the calcium group of metals. It gives but one line, an intense blue one, and, as far as is known at present, seems to resemble calcium in its properties.

After the continuous bad weather with which we have been favoured during the last 18 months, it will be some consolation to know what we have to expect in future, and this, after reading an account of some investigations by M. Renou, does not seem quite such an impossibility as it is usually supposed to be. In January last this gentlemen sent a paper to the French Academy of Sciences, in which he showed that severe winters followed each other in groups of five or six at a time, and generally recurred in nearly the same order of severity in the course of a period of 41 years. The same meteorologist has now, in a second paper, endeavoured to unravel the mystery of the recurrence of warm summers. These he finds easier to characterise by their mean temperature than by their extremes; he establishes six groups as follows:—very warm, 20° C.; good, 19° C.; middling, 18° C.; bad, 17° C.; very cold, 16° C.; exceptional, 15° C. Still there are more difficulties to contend with in classifying summers than in the case of winters. Thus the summer of 1834 was very warm at Paris and Berlin, and cold on the contrary, at Orange, showing a great variation within a comparatively small surface. Also owing to difference of exposure and want of corrections, old observations are less reliable in the higher than in the lower temperatures. As far as M. Renou has been able to judge, the period of 41 years is not so apparent in the case of summers as in that of winters; but the former seem to recur immediately after the expiration of the period of severe winters. The other seasons appear to be more easily amenable to the period of 41 years. M. Renou notices some curious coincidences: thus the minimum temperature of the year 1805 occurred on the 18th of December, and in 1846, on the 19th of the same month. In the year 1806 the same minimum fell on the 12th of March, and in 1847 on the same day. In both cases it will be remarked, the interval of 41 years is the same. It is also a singular fact that the period of 41 years is precisely that which seems to belong to the return of the solar spots.

A new use of the photographic element *par excellence*, iodine, has just been announced by M. Commandeur, that of attracting together slugs and snails. Some time ago he accidentally left in his garden a vessel in which he had been making experiments with starch and iodine; this vessel, imperfectly covered with a bit of board, remained exposed to heat and rain for the space of three weeks. At length it one morning attracted M. Commandeur's attention, and upon examination, he was surprised to find it occupied by dozens of snails and slugs, which it seems had congregated there from every corner of the garden. The experiment was continued, and became apparent that the emanations of iodine will attract these creatures from a considerable distance, when they may be destroyed by hundreds.

DISCUSSION ON ALBUMENIZED PAPER AND ALKALINE GOLD TONING.

OPENING PAPER BY C. JABEZ HUGHES.*

The usual mode of opening a discussion is to apologise for the subject, and to depreciate oneself for bringing it forward. I am sure you will excuse these conventional formalities, for no plea need be urged to establish the importance of Good Printing.

All our other processes are but preparatory steps to printing. For that we make our pyroxyline, prepare our collodion, purchase our apparatus, and rack our brains to produce perfect negatives. With this object before us we travel o'er land and water, climb glaciers, face water-falls; on mountain top, in sheltered valley, on open heath; in deep forest, or dark glen—wherever, or to whatever we point our lens, this is the consummation we always have in view—the reward for all our labour.

If not the *be all*, printing is certainly the *end all* of our various processes. It is the last crowning stone of the edifice —the very apex of the pyramid.

Yet, with all its importance, we do not do it justice. We vote it a bore, we declare it drudgery, delegate it to our assistant, put it out to be done, employ ignorant men, silly women, and foolish children to do it. We hurry it over, begrudge the time, stint the money, use the cheapest materials, and, finally, inconsistent beings that we are, express astonishment that our results are not uniformly of first-rate order.

Note the different degrees of care with which the two halves of the photographic process are conducted. For our negatives we obtain the best glass, prepare it most scrupulously, and do not dare to touch its clean surface; but our boy lets the albumenized paper lie about anywhere, and he fingers it and "paws" it all over. Our collodion we pay whatever price the celebrated maker asks for it, so that it be up to the right standard, and we watch and study it as to its age and condition; but send here and there, anywhere for our paper, and generally with an eye to cheapness.

We should not dare to keep three or four sorts of collodion, and jump from one to the other, and expect at once to get equally good negatives; yet we employ different samples of paper, treating them all alike, expecting they will or ought to "come out" equally well, and without hesitation condemning them if they have not answered our expectations. We know that different kinds of collodion require different baths and developers, and variable manipulation, but we have yet to learn that different papers require their special treatment too. In our negative bath we use the purest recrystallised or fused nitrate, but anything will do for printing. We make up one bath with religious care, and most jealously watch its condition, but the other may take care of itself. It is 60-grain to-day, may be 40 to-morrow, and the day after, in a fit of generosity, may be strengthened to 70. This week it is acid, next it may be alkaline; but too generally it may be what it likes and how it pleases.

There are many photographers who really do take pains, and study the production of their prints as carefully as their negatives, and they have their reward; but the majority do not. These latter treat the operation as if it were mechanical, instead of chemical, and expect it equally readily to be despatched. The very term "printing," by the association of ideas, helps to confirm the mechanical notion. The letter-press printer bestows all attention on the skilful arrangement of his types, the engraver on the cutting his plate, the lithographer with drawing on his stone, and wood engraver on the block; this well done, the rest is only careful "working off," or "machining." But photography is not mechanical, and will not be "machined." The simile holds good between the composing the types and making the negative, but it wofully fails after; for every photographic print is the result of a series of delicate chemical operations, and if the result is not as we wish, we must endeavour to discover where the error creeps in, and either by alteration of manipulation or variation of material produce better results. If photographers would but look at prints as chemical, not mechanical, products, and endeavour to grasp the causes that produce them, from that moment their prints would be improved and their effects more uniform.

With relation to present troubles, most of them are based upon and grow out of that fatal facility of production that was in use during the sulphur-toning period. It was necessary then only to take the print out of the pressure-frame, and immerse it in the inky hypo; and there it remained until it was "done." The present method requires much more care and attention, and by some this is given grudgingly; they shirk the proper preliminary washings, and, getting into trouble, of course, blame the process. Sulphur as a toning agent was not very delicate; much or little albumen, or none at all, it was chiefly a matter of time, and he served all prints alike; whether the paper was thick or thin, English, French, or German, he toned them all the same; like a specious, plausible, malignant, destroying demon as he was, his *in*-justice was impartial.

But our present protecting genius, Gold, is much more nice and delicate, and recognises most critically the differences of much or little albumen, of the various kinds of paper, and of minute variations of manipulation. We are now in a transition state, and shall doubtless yet arrive at a perfect toning process, which will be uniformly certain, but we must throw away some of our past notions, and not say what albumenized paper and gold *ought* to do, but what we can obtain from them. They will not yield, so we must.

Too many of our printing notions depend on those conceived during the sulphur-toning period. There is a tendency to depreciate the application of those careful rules that we apply to the production of negatives. The printing process is almost supposed as if it ought to be automatic—self-working. I don't know why we ought to assume this. It would be very desirable if it were so; but at present it is not.

In the practice of negative-taking, we are not surprised if a goodly number are not first-rate; but our prints, about which we take so little pains, ought all to be perfect. We calculate how much we can get out of a sheet of paper, and expect every square inch to turn out right.

The drift of my observations is to show that we ought not to expect to produce good prints uniformly, unless we take great care, and study attentively the conditions under which they are best produced. If this be done, I am sure we shall fail less often. We must expect less from our materials, and more from ourselves.

We depend far too much on special formulæ, acting too frequently to the letter, instead of the spirit. For example, in Maxwell Lyte's toning process by phosphate of soda and chloride of gold. In his directions, he says, employ *neutral* chloride of gold. Well, in commerce, the article is called neither acid chloride nor alkaline chloride, but simply chloride of gold; and the majority of operators assume, therefore, it is neutral, and add it to the phosphate; and being, as it always is, more or less acid, mostly the former, phosphoric acid is liberated in proportion to free acid in the gold, and a different result is produced to

* Read at the meeting of the London Photographic Society, Feb. 5, 1861.

what Mr. Lyte intended, and, of course, the process is all rubbish. Again, I have found persons toning with acid solutions of chloride of gold, when they believed they were working with alkaline; they have added the modicum of carbonate that their formula prescribed; but whether it was sufficient to neutralise the free acid always present in the commercial chloride, is a point they have never tried. A given method may work well with one kind of paper and not another. One man may produce uniformly hard negatives, and require a paper to give a soft image; whilst another gets little contrast, and must force it out in printing. In one district the water is soft and pure, in another very hard and limey; and shall one formula be applicable under all circumstances, nothing be left to the skill of the operator? and if the process fails, is the man wholly blameless?

Although the laws of chemistry are regular and certain, yet who can anticipate or give directions to another how to act under every emergency? The man who depends exclusively on formulæ, who does not grasp the spirit as well as the letter of instructions, will always be liable to derangements. I make these remarks because I so frequently hear paltry and foolish objections urged against processes and formulæ; men should take up subjects large-heartedly and frankly, and not be discouraged easily, work themselves out of their difficulties, and not allow success and failure to depend so much on external circumstances.

(*To be continued.*)

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 6th February, 1861.

Among the photographic curiosities at present exciting the interest of the scientific world, may be mentioned a photographic copy of a portrait of Kepler, the father of modern astronomy. This portrait, for some time lost and forgotten, is supposed to be the most faithful likeness of the great astronomer extant; it was given by him to his friend Matthew Verner, of Strasburg, who bequeathed it to the public library of that city. This interesting and valuable picture is unfortunately in a very bad state of preservation, and the photograph cannot, as a faithful copyist, but render its defects. At the same time it is good enough to give a very favourable idea of the noble and agreeable features of the original.

Mr. Persoz proposes a new method of analysing saltpetre. The foreign substances usually mixed with nitrate of potash are, 1st, water; 2nd, matters insoluble in water; 3rd, chlorides; 4th, sulphates. The quantitative analysis of these substances is conducted in the following manner:—

Separation of the water.—The saltpetre is dried in a platinum capsule, which is then heated to the temperature at which the salt begins to fuse. The difference in weight indicates the quantity of water.

Separation of insoluble matters.—The saltpetre fused as above is dissolved in a given quantity of water. The solution deposits a residuum which, collected on a filter previously weighed, and which, weighed again after being well washed and dried, gives the weight of the insoluble matters.

Separation of the chlorides.—The filtered solution, which we will call N, separated from the insoluble matters, is precipitated by nitrate of silver in the same manner as silver is analysed by chloride of sodium. Thus, a silver test-liquor serves to determine the chlorides in the same manner as a test-liquor of chloride of sodium serves to determine the quantity of silver. If bromides or iodides exist in the saltpetre, they are thrown down with the chlorides, which is of no consequence in this analysis. These salts are rarely present, and never but in very minute quantities.

Separation of the sulphates.—This part of the analysis presents some difficulties, on account of the property possessed by the insoluble sulphates of dissolving in the alkaline nitrates. In one litre of water dissolve 259·8 grammes of pure well-dried chloride of barium: each cubic centimetre of this solution will contain 0·258 gramme of chloride; consequently, it represents 0·179 gramme of sulphate of soda, and 0·208 gramme of sulphate of potassa. Measure 200 cubic centimetres of the solution N, prepared as above; and after acidifying it with pure nitric acid, put it into a platinum crucible, and make it boil; then add it little by little to the test barytic solution, until the latter is no longer clouded and remains in excess. Arrived at this point, an alkalimetric test-tube is filled with the liquor N, which is dropped into the capsule containing the barytic solution, to neutralise the excess of the baryta.

Separation of the nitric acid.—Although the preceding operations may suffice, and, in knowing the quantity of water, and of the chlorides and sulphates, the nitrate of potassa can be calculated by the difference; but the nitric acid may be tested directly in the following manner: take, for example, a quantity of saltpetre representing two grammes of the salt deprived of water, the quantity of water it contained being previously ascertained; add to these two grammes of saltpetre, a quantity of the solution of bichromate of potassa containing exactly four grammes of this salt crystallized; the saltpetre is dissolved in this liquor, and the whole evaporated in a platina crucible previously weighed. When the two salts become dry, and the heat begins to melt the mixture, a very vivid reaction ensues, and abundance of nitrous fumes are given off, at the same time the chromic acid seizes upon the base of the nitrate. When we are sure that all the saltpetre is decomposed, the crucible is left uncovered, to admit of the absorption of the air, and when it is cold it is placed in a scale. The diminution of weight observed represents exactly the weight of the nitric acid contained in the saltpetre analyzed. For example: weight of crucible thirty grammes; nitre to be analyzed, supposed to be dry, two grammes, bichromate of potassa, four grammes, total thirty-six grammes. If, after calcination, the crucible weighs only thirty-five grammes, it shows that one gramme of nitric acid has been separated from the saltpetre, the weight that will represent the quantity of nitric acid it contained.

Benzine is employed with good effect in insecticide. Insects are instantly asphyxiated by it, and a remarkable effect resulting from the kind of intoxication benzine produces is the rigidity assumed by various insects subjected to its influence, particularly the lepidoptera. One or two drops of benzine is sufficient to give the finishing stroke to the largest insect of our woods and fields. The rigidity is so great, after death, that the wings of a *libellula*, if touched, bend, rather than break. The *diptera*, whose flight, although due to two wings only, is so energetic, exhibit analogous phenomena, especially the two species *musca vomitoria* and the *cristalis similis*, legions of which hum amid the flowers of our gardens and the leaves of the forests. It is singular, that the next day after the benzine has done its work, and has evaporated, the suppleness of the articulations is restored. It is said that even rats and mice quickly disappear from a place in which a few drops of benzine are sprinkled.

THE ALBUMEN NEGATIVE PROCESS.

Sir,—I mentioned in a previous communication on this subject, that the process I employed, was that described in your columns by Mr. Archer, but as his letter is in another volume, I will, at your request, give a very brief outline of the formula as I use it, and by which a satisfactory picture may always be obtained.

1.—Coat the plate with—

Albumen (one egg)	1 ounce
Syrup	½ „
Iodide of potassium	7 grains
Bromide of potassium ...	3 „

[The syrup consists of 1 lb. of loaf sugar to half a pint of water, boiled for a few minutes.]

The above quantity will be sufficient for some thirty plates, stereoscopic size, and should not be used till at least three days old. It may be used over and over again till the last drop, care being taken to filter each portion before pouring it on the plate.

2.—Thoroughly dry the coated plate over a spirit-lamp, or a gas-jet, draining off the surplus on a piece of clean blotting-paper.

3.—Insert for half a minute while *warm* (not *hot*) into a bath of—

Nitrate of Silver	45 grains
Acetic acid	1 drachm
Water	1 ounce

4.—Wash well with common water.

5.—Insert for about a minute into a pan containing two grains of common salt to the ounce of water.

6.—Wash thoroughly with common water,—the more the better.

7.—Dry, first spontaneously, and then by gentle (not excessive) heat before a fire.

Plates so prepared will keep quite unimpaired during a month; I have never tried them longer.

Develope in a pan containing sufficient just to cover the plate, of—

Gallic acid	6 grains
Water	1 ounce

with the addition of ten minims of a five-grain nitrate of silver solution to every ounce of developer. A properly exposed picture will require no more silver, and will be completely developed in about two hours, without any further attention being paid to it.

If it be desired to develope more quickly, first moisten the plate with clean water, then use—

Pyrogallic acid	1½ grain
Citric acid	1 ,,
Water	1 ounce

with the addition of five minims of the five-grain silver solution to every drachm of the developer. The picture will appear in about five minutes, and the development will be complete in about ten minutes. A little more silver may be added, if necessary, when all the details are out, but it is seldom required.

I should add that it is stated that gallic acid with acetate of lead is preferable to either of the above developers, but it has not proved so in my hands.

By a typographical error in my letter which appeared in your impression of January 4th, my meaning is reversed. The passage stands, "I think these methods cannot be considered properly, as they have been hitherto termed modifications of the Fothergill process," &c.; my argument was that the "Taupenot" was an albumen process, and, for reasons that I detailed, I thought that the several methods of Messrs. Petschler and Mann, and Dr. Ryley, "cannot be considered properly, as they have been hitherto termed modifications of the Taupenot process; but that they are rather modifications of the Fothergill process, which is, in the proper sense of the term, a collodion dry process." As I consider this distinction is important, I shall be obliged if you will permit this correction to appear.—Yours faithfully, F. Richards.

Proceedings of Societies.

London Photographic Society.

The annual meeting took place on the evening of Tuesday, February 5th. C. B. Vignoles, Esq., F.R.S., vice-president, in the chair.

The minutes having been read and confirmed,

The Chairman explained to the meeting that, owing to the delicate state of Sir F. Pollock's health and the claims of his parliamentary duties, he was unablo to attend the meeting. The first business now before them was the election of officers for tho ensuing year. In accordance with Section VII. of their rules, any member having any additional names to propose besides these nominated by the council should have done so at the previous meeting. No names having then been proposed, none were now eligible. Whilst the report was being read, the ballot-box would be passed round, and members would drop in their papers.

A Member asked if the lists of names nominated by the council had been sent round to members.

The Chairman said they had been published in the *Journal*.

A Member would have been glad to have had the addresses of the gentlemen proposed, with a view to ascertaining whether they resided in town or country.

The Chairman said the rules did not specify that the officers should be resident in town.

Mr. Le Neve Foster said, that of the five gentlemen proposed for election as members of the council, four were resident in town; and the president, vice-president, and treasurer proposed were all three resident in town.

Mr. A. R. Hamilton, in the absence of Dr. Diamond, then read the report of the council and the balance sheet for the year.

The Chairman said it would now be necessary to appoint two scrutineers to examine the papers, some of which, from not being properly folded, had got by mistake into the negative box.

A Member (Mr. Sedgwick, we believe) said, that this was a perfect farce of an election.

The Chairman said, if any member had wished to propose other members, he ought to have done so at the December or January meeting; none having done so, no other gentlemen but those nominated by the council, and whose names had been sent round, were now eligible for election.

Mr. Sedgwick: And for this reason it was a farce to send round the ballot-box, when there was no choice possible.

The Chairman then announced that Sir F. Pollock, F.R.S., Lord Chief Baron, was re-elected as president, Professor Bell, F.R.S., was elected as vice-president; and A. R. Hamilton was re-elected as treasurer. The gentlemen elected as members of council were—The Earl of Caithness; Warren De la Rue, F.R.S.; Walter Hawkins, F.S.A.; Rev. J. R. Major, F.S.A.; and T. R. Williams.

The gentlemen retiring were Roger Fenton from the vice-presidency, who takes the seat of Professor Bell at the council; and from the council, Messrs. Hardwich, Mackinlay, Marshall, Pollock, and Wenham.

The Chairman said, the adoption of the report had been moved and seconded, if any gentleman had any questions to ask or remarks to make upon it, now was the time.

[We hope to be able to give a copy of the report in our next; but in order to make the remarks which follow intelligible, it is necessary to state that, in referring to the death of the late Peter Fry, his early labours in photography, and his association with Mr. Archer in the early history of the collodion process, allusion was made to the part he took in resisting the claims of Mr. Talbot, who was referred to as wishing to patent the use of the sun altogether.]

Mr. Malone could hardly allow such a report as they had heard read to pass without some comment. In that report allusion was made to the late Mr. Fry, and in passing a just tribute to his memory reference had been made to past circumstances, which had involved a good deal of unpleasant feeling. He referred to the allusion to Mr. Talbot's claims. The report did not give a proper account of the transactions referred to, and he must say it was conceived in a partizan spirit. He had hoped that spirit had died out, and but for the present manifestation of it he should have been silent. It was stated, in the first place, that Mr. Fry had begun his work in connection with photography before the results of Mr. Talbot's experiments had been developed. That was a gratuitous remark; an attempt to exalt Mr. Fry at the expense of Mr. Talbot.

The Chairman said he must interpose to suggest that good taste should prevent these allusions to Mr. Fry, who was now dead. There was a good maxim *de mortuis nil nisi bonum*.

Mr. Malone said that the maxim quoted was doubtless a good one, but every one must judge for himself of the right application of it. This was not a question of good or bad taste, but of historical fact; and to correct the error of the roport in this respect was his only object. He wished to say nothing whatever that could be regarded as offensive to Mr. Fry. H i remarks were entirely directed against the report, or the writer of the report, for bringing these names into collision. The statements made in the report were not true. It was alleged that Mr. Talbot's object was to patent the use of the sun itself.

The CHAIRMAN would not allow such an observation to be made. It was not true.

Mr. MALONE took down the words at the time. It was distinctly stated that Mr. Talbot's object was to patent the use of the sun altogether.

The CHAIRMAN, on referring to the MS., said the words were there, but the essence of the thing was altogether different.

Mr. MALONE said the reference to Mr. Talbot was altogether gratuitous; he had made no such claim.

The CHAIRMAN.—It does not say he did.

Mr. MALONE must be permitted to reiterate that the statements made in connection with Mr. Talbot's name were most invidious, and appeared intended to cast odium upon him. The question was whether Mr. Talbot was entitled to take out a patent for his invention or not. In reference to the trial referred to he was not going to reopen the question, but he must remark that he was present at the trial, and the subject was not put by the judge correctly before the jury. If it had been—

The CHAIRMAN could not allow these remarks to be made.

Mr. MALONE said his remarks might appear invidious, and, but for the partizan spirit displayed in the report, he should not have made them. Mr. Archer's name was introduced into the report, and even if a man were dead, his name should not be made use of to cast odium on the living without calling forth a reply.

The CHAIRMAN would not allow this allusion. Mr. Archer was not named in the report, and he would not permit these remarks. He was sure every man would join him in protesting against it.

Mr. MALONE said that Mr. Archer's name was introduced into the report, and for the purpose of contrasting it with that of Mr. Talbot. However much averse he might feel to make these remarks, since the subject had been referred to, he could not permit Mr. Archer to have more credit than he deserved, and, in reference to the publication of the collodion process, Mr. Archer had said to him, when sitting beside him in one of their meetings, that "if Mr. Talbot and he had put their heads together they might have made a nice thing of it."

The CHAIRMAN again said he must stop these remarks; no one had shown such a spirit but Mr. Malone.

Mr. MALONE said his remarks had been provoked by the unjust allusions of the report.

Tho CHAIRMAN thought it was in very bad taste.

Mr. MALONE said it was simply a question of truth and justice. He had not only a right, but it was his duty to make these remarks. No one present knew so well as himself all the circumstances, and he felt it to be his place to defend Mr. Talbot from the unjust aspersions of the report.

The CHAIRMAN said it was the general impression that Mr. Talbot did throw obstacles in the way of the art's progress.

Mr. MALONE wished then, from his knowledge of the facts, to remove that impression.

The CHAIRMAN.—Mr. Talbot's proceedings cast a deep stain upon his name at the time. It was true he retracted somewhat afterwards, but the general feeling was against him at the time.

Mr. MALONE, as a party to all the arrangements at the time, must repeat that Mr. Talbot never wished to throw obstacles in the way of amateurs using his process; he only made it a condition that they should not practise it for profit, and this he was bound to do to protect the rights of his licensees. He felt it his duty to assert these facts, and reply to the remarks casting odium on the name of Mr. Talbot. If he appeared warm he assured the meeting it was more warmth of manner than asperity of feeling. He would not move any amendment to the report, but would content himself with the clauses referred to.

The CHAIRMAN thought his purpose would have been better answered by a few words without that animus, which all must deplore, much as they respected him. For his own part he had listened with great pain.

The report was now put to the meeting and carried.

The CHAIRMAN said, before calling upon Mr. Hughes, who was to open the subject of albumenized paper, he would call the attention of members to some wood blocks on the table, on which were photographic impressions ready for the engraver. They were executed by Mr. Thomas Bolton, and brought to the meeting by Mr. Delamotte. These photographic impressions were upon the prepared wood, the lights of the picture showing the white preparation on the surface, and not the mere surface of the wood. Mr. Bohn laid upon the table for inspection a copy of a new edition of "Jackson's History of Wood Engraving," which contained two of the blocks photographed and engraved by Mr. Bolton.

Mr. HUGHES read a paper "on Albumenized Paper, and Alkaline Gold Toning" (see p. 66). He prefaced the paper by saying Mr. Hardwich's object in proposing the discussion of the subject of albumenized paper and the troubles experienced in toning it with alkaline gold, was, not merely to have the opportunity of expressing his own opinion, but of eliciting the ideas of other members, so that by a comparison of experiences, if possible, to elicit some facts that might aid in removing these troubles. The distinct purpose, therefore, is discussion; and it is to be desired that members will be induced to take an active part in it. Mr. Hardwich asked me to open, and, fully reciprocating his wish that we might have not merely a paper from him, but a discussion among ourselves, I consented, and am, therefore, here without the usual announcement. My object is merely to open the subject by such general considerations that will invite others to follow, throwing out suggestions for you to embody.

At the conclusion of the paper, which was repeatedly interrupted by applause, the meeting gave hearty vent to their admiration.

The CHAIRMAN, on proposing a vote of thanks, remarked that the meeting could not but be greatly obliged to Mr. Hughes for the great good sense, striking illustration, and combination of wit and wisdom his paper displayed.

Mr. HARDWICH thought the time was come when they ought to have a better paper and a more certain method of preparing it than they had hitherto had. The new process of toning was now getting into universal use, and it was admitted that more difficulties existed than before. Complaints were made constantly by many persons that they could not get on with it. There was one point in Mr. Hughes' paper with which he was struck as being entirely opposed to his own experience. It was now some years since a committee was formed, in connection with the society, to examine into and report upon the question of printing. They had obtained samples of paper from various makers. He then made up his mind as to the characteristics of the various kinds; but he found some of these conclusions differed entirely from the experience of Mr. Hughes with the same papers, which led him to the opinion that the papers must have altered since that time. The papers which he had found soft Mr. Hughes had found hard. In his hands the English papers were hard and took a high gloss; Mr. Hughes found them soft and absorbent. He thought that the cause would be best served by a thorough examination into the question of sizing; so as to know on what the production of a uniform and satisfactory paper depended. As to the method of toning, he had examined the alkaline process with great care, and found in it many elements of security. The point required was, therefore, a suitable paper; for it was certain that minute changes in the quality and preparation of the paper would effect the results by this process more than by the old one. He did not despair of overcoming the difficulties by a proper examination, and he thought the right direction for present examination was an enquiry into the influence of sizing. At present we did not know much on the subject; we knew that one class of papers was sized with gelatine and another with starch. But two papers both sized with starch would give very different results. Various manufacturers had, doubtless, each their own method not known to others. He thought the paper required was a starch sized paper—some samples of the *Rive* paper appearing to meet all their wants; but the difficulty was to ensure uniformity. A gentleman called on him at King's College, about eighteen months ago, with a paper said to be made in this country. With this he had made a number of experiments and was nearly satisfied. It gave nice tones, and was free from mealiness, and the other deficiences alluded to. He did not know whether this could be produced uniformly as good; but since then he had got none so good. If he rightly understood the matter, the name *Rive* did not necessarily imply either one maker or one quality.

The CHAIRMAN asked if the composition of the original pulp were not as important as the sizing.

Mr. HARDWICH said that was doubtless an important question;

but the sizing was, he thought, more so. Some of the paper which gave satisfactory results, he had found on testing, was decidedly acid, and he had since tried the addition both of acetic acid and citric acid to the albumen. Of the latter he had added two grains to each egg. It had the effect of making the albumen very thin and limpid, so that it ran through filtering paper nearly as freely as water, but still gave a good gloss to the paper. A general impression was that the thinner the albumen was, the less gloss it would give; but in this case the contrary was the fact. It was thought by some that the addition of such substances as gum would, by making the albumen thicker, give more gloss to the paper. The truth was, they caused less gloss. There was no doubt then that the addition of acid made the application to the paper easier without interfering with gloss. It had, however, somewhat interfered with toning; the paper with which he was then working was one which, even without albumen, did not tone readily. He thought if a plain paper which toned readily, were coated with albumen, which had had citric acid added, probably both difficulties would be met. One of the greatest difficulties in the case was the fact that photographers were entirely in the hands of makers of paper, and they probably did not quite know what was required. He trusted the subject would now be thoroughly investigated.

Mr. Malone said, that one difficulty arose out of the fact, that large makers did not think it worth while to step out of their regular course of business, in order to make experiments for photographers, and that English makers were not in the habit of making the same paper as the continental makers. Again, the secrets of sizing were not generally disclosed, and we did not know, therefore, many of the points which materially affected the question. At times our own makers failed to size their papers to their own satisfaction, from decomposition taking place in the size, and the same might occur in continental papers, and thus affect uniformity of result. If the resinous soap used by French manufacturers became decomposed, and the resinous matter was liberated partly on the surface, that would produce an irregularity in albumenizing, as these parts would resist the albumen, whilst others would absorb it. This might be one cause of want of uniformity. He thought it might be well to treat a paper with a weak alkaline solution to alter the condition of surface, and then try if albumen would take better and give better results. Unless they could by some means get rid of the necessity of trusting to others, they could have no security at all. He hoped the society would put forth all its influence to induce some maker with adequate machinery to take the matter in hand, or perhaps they would have to endeavour to form some kind of joint-stock company for the purpose. Regarding the difficulties of preparing the paper he thought many of them arose from not following some one good method. He believed it was at times customary to use the albumen in a state of putrefaction. It should be known that, under these circumstances, sulphur and phosphorus were liberated, and injurious results produced. He thought that the wilful preparation of paper in this way amounted to something like fraudulent adulteration. As to the question of silver, although where rapid printing were required, 100 grains might be used, he thought if the silver were pure, sixty grains would give good results, and be found a more profitable strength than the former. If the nitrate were dissolved and evaporated more than once, and then heated barely to fusion, so that the whole of the nitric acid were expelled, it might then be used at once. As to the toning, he was not going to defend the old method, but still he thought Mr. Hughes' very doleful picture was a little overdrawn or exaggerated, and that it was scarcely philosophical thus to overstate the case. It must not be overlooked that some of the pictures toned by the old process did remain permanent. It was not, moreover, quite clear, that gold itself was unattackable by sulphur compounds, indeed, it was known that sulphide of ammonium would decompose gold, and as we could not exclude our prints entirely from the action of sulphur we were not quite certain even of the permanency of gold-toned prints. So long also as some of the earliest photographs remained unchanged, it was clear there was something more in the subject than our philosophy had explained.

The Chairman: You think that the devil is not quite so black as he has been painted.

Mr. Malone: Precisely.

Mr. Shadbolt feared he would be in a minority in his opinion, as he preferred the gelatine sized papers to those sized with starch. He had a perfect recollection that when the printing committee examined this subject, they came to the conclusion that Hollingsworth's paper was one which gave the best results, both with gold toning and sulphur toning. That English paper was more difficult to manipulate he would admit; it was more difficult to albumenize, and more difficult to manipulate after albumenizing, on account of its tendency to curl up; but still he thought few photographers would object to a little trouble in securing good results. There was another point; much had been said about the advantage of mixing a little free acid with the albumen. From experiments made years ago his convictions were in the opposite direction, and he preferred to mix a little ammonia with the albumen, which made it more fluid and prevented it running in streaks; and the only care it required, was, that it should be dried at once before a brisk fire. There was another point he would mention. Some time back a paper was read before the Manchester Society, by Mr. Mabley, who noticed the fact that by using a little free nitric acid in the nitrate bath, the prints received the toning action more readily, an observation in which he was corroborated by other members at the time.

Mr. H. G. Bohn said he had not known before that so much difficulty existed in connection with this subject of paper, and he now thought there where men who would make experiments for them; and would supply them with a paper from pure linen rags. This paper he thought if sized with pure vellum size, would probably answer their purpose. It would probably be double the price now paid, but that he thought would not matter. There were three houses he thought who could make them a suitable paper; he would not name them there, it might be invidious, but would be happy to tell any of the gentlemen privately.

A conversation on this subject ensued, in which the Chairman, Mr. Hardwich, Mr. Shadbolt, and Mr. Bohn, the latter gentleman remarking that none of the French papers were from pure rags, but commonly contained as much as 25 per cent. of wood, a substance he conceived scarcely likely to suit the purposes of the photographer.

Mr. Sebastian Davis wished to make one or two remarks on testing the nitrate of silver bath. Mr. Hughes had referred to the hydrometer, and although in another paper he had given an interesting account of experiments with this and other testers, he (Mr. Davis) must remark that the hydrometer was scarcely a philosophical test for such a purpose, because of the accumulation of nitrates of soda, ammonium, &c., which must occur in the nitrate bath, adding to its specific gravity and disturbing the conditions in which the hydrometer afforded any idea of the amount of silver in the bath. It was a very simple and efficient method to use the ordinary minim measure, which would serve without any other specific instrument. As the equivalent number of nitrate of silver was 170 ($Ag\ 108\ N_{14}\ O_{48} = Ag\ NO_6$), and that of chloride of sodium 58·5 ($Cl\ 35{\cdot}5\ Na\ 23$), it followed that ·344 grains of the latter would convert 1 grain of nitrate of silver into a chloride. If, therefore, we dissolved 88 grains of anhydrous chloride of sodium in one pint (16 ounces avoirdupois) of pure water, we should obtain a test solution, each half drachm or 30 minims of which, measured in the ordinary minim glass, would convert one grain of nitrate of silver into the metallic chloride.

Mr. Thomas said he had heard of many of the difficulties of toning albumenized paper, but had never met with them himself; probably because he was very careful. He preferred the Saxo paper, as giving an agreeable colour, but it should be carefully selected of good quality. He used nearly pure albumen, and was careful to have the room in which the albumenizing was conducted at a sufficiently high temperature to dry the paper rapidly.

Mr. Hardwich asked Mr. Thomas if he had ever tried the use of acid.

Mr. Thomas had never used it, as he got on very well without it.

Mr. Shadbolt asked Mr. Thomas, if he would describe what he meant by an agreeable colour.

Mr. Thomas said it was somewhat difficult to describe, but he might refer to Mr. Bedford's pictures in the present Exhibition, as illustrations of what he meant.

Mr. Sutton said perhaps some specimens of stereographs which he laid on the table would afford illustrations of the tone meant.

After some further conversation the discussion was adjourned until the March meeting, and the proceedings terminated.

Newcastle-on-Tyne and North of England Photographic Society.

We recently announced the formation of a photographic society in Newcastle-on-Tyne. The new society is now fairly organized, and gives high promise of activity and success. The officers for the current year are as follows:—

President—The Right Hon. T. E. Headlam, M.P.

Vice-President—G. C. Warren.

Honorary Secretary and Treasurer—Joseph Fraser McKie.

Council—P. M. Laws, W. H. North, R. Porteus, R. S. Hill, Robt. Anderson.

The first general meeting was held at 28, New Bridge Street, on Friday evening, Mr. George Christopher Warren, one of the vice-presidents, in the chair. Mr. Joseph Fraser McKie, Hon. Sec. read a detailed account of the organization and establishment of the society, also its constitution, and list of officers for the present year, which elicited the hearty plaudits of all present. The Chairman read a paper entitled, "Photography as it is." He remarked that—

This being the first paper read before the society, he did not propose to bring before them any new process, but rather to give an account of the present state of the art, and show that photography was not confined to mere portraiture or depicting of landscape scenery; he also stated that the art had reached such a degree of importance that no less than four journals were now devoted solely to disseminating photographic information. Numerous societies now exist, and are instrumental in bringing forward improvements in the various processes of the art, and in bringing to bear the knowledge and experience of many of the most noted scientific men of the day, in their several vocations. The various societies have obtained the patronage of men of rank and fortune. At the meeting of these societies we find discussed every subject connected with the art, comprising chemistry, optics, mechanics, &c. &c. Mention was made of the various modifications made in the several processes during the last few years, particularly with respect to the various dry methods lately introduced. In speaking of the improvements in the optical department, special mention was made of a new lens invented by Mr. Sutton, whereby a picture embracing a much larger angle of view than the ordinary view lens is capable of producing, can be taken. Reference was then made to the various new printing processes for insuring permanency and stability, the present mode of printing with silver salts being by every honest photographer considered unsatisfactory. This part of the paper was illustrated by specimens of various kinds of photographic carbon printing and engraving. Reference was made to the application of photograpy to wood engraving, lithography, &c., and special notice was made a patent process for obtaining photographs on glass and ceramic ware, requiring to be burnt in a furnace for the purpose of fixing. A specimen of this process was introduced. Amongst other applications mention was made of its use in astronomical observations for registering the variations of the thermometer, barometer, and magnetic needle. It was also useful to the architect, the engineer, the microscopist, the military profession, &c. It was also stated that photography was being used in the Ordnance Office at Southampton for reducing the ordnance surveys, and that by the use of the art for this purpose, a saving to the country of £30,000 will be effected. Towards the conclusion of the paper, reference was made to the influence of the art on the artistic taste of the public. He glanced at several useful applications of photography, showing that it is by no means confined to portraiture, but that its sphere of usefulness is very large. In conclusion, he said, if each member gave an occasional paper, or statement of either failures or successes in any branch of the art, or even put a few questions as to the why and wherefore of anything connected with it, he had no doubt they would always be able to pass off a pleasant, instructive, and amusing evening.

At the close of the paper an animated conversation took place, which lasted some time. The rest of the evening was spent in examining some fine large photographs kindly supplied by Messrs. Laws, North, and Warren. Mr. Laws presented two proofs of his very beautiful views of the Ruins of Tynemouth Priory, for the portfolio of the society. A vote of thanks was given to Mr. Laws. The thanks of the meeting was also given to Mr. Warren for his excellent and interesting paper. The next meeting will be held on the first Friday in March.

Photographic Notes and Queries.

Magic Lanterns.

Sir,—As many of your readers are at the present time interested in *magic lanterns*, it may benefit some of them if they will refer to Nos. 84, 87, 88, 89, 90, where they will find some little correspondence on the subject. If not occupying too much of your space, I should like to repeat a hint then given, viz.: to form an exchange club of transparencies suitably mounted for the *magic lantern*, on the principle of the Stereoscopic Exchange Club. If any of your readers think the *idea* worth carrying out, I shall be most happy to render any assistance in my power; for this purpose I enclose my address.—And remain, yours very respectfully, F. R.

[We shall have pleasure in aiding our readers to form an Exchange Club for the purpose indicated.—Ed.]

Hints to Operators.

THE HYDROMETER BATH-TESTER.

Mr. J. C. Leake, jun., whose inventive ingenuity has given several clever contrivances to the photographic world, sends us the following:—

I fully agree with the remarks made by Mr. Hughes, at a recent meeting of the North London Society, on the use of the hydrometer test for the silver solutions used for sensitizing paper, having myself made use of the principle for five or six years with complete success.

The instrument I use, however, is not a regularly manufactured hydrometer, but a home-made one, which, with the method of making, I will, with your permission, describe.

Take an ordinary test-tube, about four inches long and half an inch diameter, and glue into it a slip of paper having a line drawn across it, about an inch from the top, or open end of the tube. A cork must now be fitted into this, and, having procured some very small shot, and some solution of the strength required for printing, say sixty-five grains, in which to float the tube, drop the shot into the test-tube till the line is brought to a level with the solution, of course allowing for the weight of the cork. If this be carefully done a very accurate instrument will result. To use it proceed as follows:—Pour into a suitable vessel the solution to be tested, and, if it be found too weak, add a 120-grain solution till the requisite density is obtained, and the mark is again level with the surface of the solution.

Of course if a little time be spent in graduating the tube in the first instance, the number of grains deficient per ounce can be ascertained; but I have found the first-named plan sufficient for all practical purposes.

Hoping this may prove useful to those, who living at a distance from town, may not be able to procure the usual form of hydrometer,—I remain, &c. J. C. Leake, jun.

[Mr. Leake has handed us a bath-tester made on the principle he has described, which for general practical purposes, will, we doubt not, answer exceedingly well. The one before us is weighted with mercury; but we imagine that the small shot suggested will, in the hands of amateur mechanics, answer better, as it is difficult to cork down mercury, so that it will not escape in minute globules when the tester is laid down. The method of making the test-tubes, referred to by Mr. Leake, is described at page 77 of the Photographic News, vol. iii, in the series of articles "Amateur Mechanic." As the home-made instrument is only recommended to those who have not ready facilities for procuring a properly graduated meter, the means of making the test-tube may be desirable. We trust that, for printing purposes, many of our readers who have neglected the testing of their solutions hitherto, will, when the means are so simple, avail themselves of its advantages.—Ed.]

A Correspondent says:—In order to show how fully I appreciate the Photographic News, I take this opportunity of acquainting you, that I am now very busy recording in my note-book such recipes, &c., as have been, from time to time, given in your work, and which will be most useful to me in my future career; and by continuing my entries therein, as each number of the News issues from the press it will form a valuable reference book, in which I hope to be able to insert anything of interest that may hereafter come within my own observation.

Many of our readers would find this practice of great value, for the double purpose of forming a useful book of reference, and fixing the subject in the memory.

Talk in the Studio.

PHOTOGRAPHY AT ST. PETERSBURG. H. Denier, a very celebrated Russian Photographer, bids fair to shoot a head of all we have yet produced in the way of photographic portraiture. We saw recently a large group of eight, from a plate about 18 by 14, each figure in focus, perfect in half tone, and without signs of distortion. The grouping was easy, natural, and graceful; nothing of artistic effect being sacrificed to the generally limted powers of the lens, which in this case appeared to meet the demands made upon it.

COPYRIGHT IN WORKS OF FINE ART.—The Attorney-General gave notice in the House of Commons, on Tuesday evening, that he would move, on Friday the 15th, for leave to bring in a Bill to amend the law of copyright in works of fine art. We trust that photographs will find recognition in the new Bill.

DISPUTED COPYRIGHT.—A case of considerable interest to photographers will be heard at Guildhall on the 13th. The action is for infringement of copyright in an engraving, by the sale of photographic copies. Mr. Shew is the defendant.

PHOTOGRAPHIC COLOURISTS' CLUB.—Messrs. A. H. Wall of 28, Old Bond Street, and Walter Petty, of 121, Regent Street, are now engaged in organising a club of photographic colourists, one of the chief objects of which will be of professional utility and importance. Communications will be gladly received by the above gentlemen.

ROYAL ACADEMY OF ARTS.—Mr. P. F. Poole has just been elected Academician in the room of the late A. G. Chalon. Richard Ausdell, Thomas Faed, Edward M. Barry, and Baron Marochetti, were elected Associates.

NEW DRY PROCESS.—In the new edition of "Mr. Harwich's Photographic Chemistry," a new dry process will form an interesting feature. Tannin plays an important part in the preservative, and we hear excellent accounts of the certian and beautiful results of the new process.

A NEW METHOD OF COLOURING PHOTOGRAPHS has been discovered by Professor Seibertez, a painter of Munich. He uses the colours in a dry state, and fixes them by the water-glass.

SILVER ORE.—A new method of extracting silver from the ore, said to have been suggested by the photographic process of fixing, with which it is identical in principle, has recently been introduced by Herr von Pakera, an Austrian chemist, and is exciting considerable attention. The silver ore is first roasted with green vitriol and common salt, so as to produce chloride of silver. This is dissolved by means of hyposulphite of soda, and sulphide sodium is then used to precipitate the precious metal as sulphide of silver. This, on being heated, allows tho sulphur to escape as vapour, and the silver is left pure.

PHOTOGRAPHIC CHEMICALS IN RURAL DISTRICTS.—*The Chemist and Druggist*, a monthly circular, issued only to "the trade," in alleging its reasons for supplying a brief description of the Photographic Chemicals which should be found in the stock of every village chemist, thus facetiously describes the position of the dispenser of drugs in the rural districts:—Photography has spread so wonderfully through the length and breadth of the land, that there is scarcely a hamlet or village too small or insignificant not to be visited at least occasionally by some of the votaries of the art. The quiet chemists of the picturesque townlets are now and then frightened from their propriety by the apparition of a mild gentleman in spectacles, with very black fingers and wristbands, who asks, in a very courteous, but excited manner, for a small quantity of pyrogallic acid, he having "unfortunately left his bottle behind him"—or, if there is no artistic "bit" in the neighbourhood, the questioner is very possibly a mountebank-looking party, in a velveteen coat, with no shirt collar, a closely shaven beard, and curly black hair, who asks for "two hounces of postif clodion, nooly mixed." The poor chemist is aghast, he looks furtively in his Pharm. Lond. for 1833 for pyrogallic acid, and finds nothing but gallic acid, which the mild gentleman politely tells him will not do. As for the "postiv clodion," he supposes the man must mean collodion, and forthwith serves him with two ounces of it, in a fine ropy condition, which is shortly afterwards returned by the seedy "professional," with a few observations not remarkable for their elegance, or their friendliness to the chemist's eyes. The poor amateur is obliged to go away disappointed of his view, and the "professional" is prevented from taking a number of patent enamelled American ivory-type portraits of the Chloes and Strephons of the place, at 6d. each, frame and glass included.

To Correspondents.

INSENSITIVE.—The nitrate bath will dissolve off the albumen from two causes, either being very weak or very alkaline, or both. The repeated use of kaolin tends to produce alkalinity. See Mr. Hughes's article on "Bath Testers," and make up the solution to a full strength.

CAPT. BELL.—You will find formulæ for toning in the ALMANAC, which give excellent results.

W. H. WARNER.—We will have pleasure in proposing you as a member. Mr. Howard's address is 12, Whittingham Villas, Studley Road, Stockwell.

W. W. M.—Your 9in. plano-convex lens may be used with artificial light, on the same principle exactly as the condenser in Woodward's camera. See article in our next number.

M. M. D.—We believe the Hydrometer Tester is kept by dealers generally. As Mr. Hughes advocates its use he is bound in consistency to keep it, and we believe you can procure it from him. See Mr. Leake's communication in the present number.

SEASIDE.—The Photographic Exhibition generally closes towards the end of March.

N.—Your communication is interesting, and we will give it further attention. Distilled water may sometimes contain a minute portion of organic matter if kept long in a vessel of wood, &c. It would not necessarily affect the nitrate of silver except on exposure to light. The addition of a bromide will generally partially restore the sensitiveness of an old insensitive iodized collodion. [This answer was in type last week, but was omitted through press of matter. We are always glad to receive your interesting communications.]

J. N.—1. The back lens of the Triplet can be used as an ordinary view lens, and covers a field about one-fourth larger than the whole combination. 2. The lens referred to in the description you mention appears in all respects similar to Mr. Dallmeyer's stereo lens, with the exception that in the latter the back lenses are 2½ inches in diameter, and those described, 2¾ inches. The back lenses are not cemented. The front and back lenses in the description to which you refer appear to be a little nearer together than in Mr. Dallmeyer's, in which the same result—lengthening the focus, and consequent larger field—is obtained by making the back lens larger. We have already stated our opinion of one we have had in use about six months. The literals to which you refer are very provoking to us. The hurry attending the final revision is the only plea in mitigation.

JUVENIS.—We prefer in portraiture to focus for the eyes, using the full aperture, and then insert such a stop as the light will permit afterwards. In landscape for the most important object. Where the light will permit it is as well to focus with the stop *in situ*; but sometimes this is difficult, and the stop must be inserted afterwards.

PROTOSOL.—See the papers of Mr. Warren De la Rue and Mr. Fry on "Celestial Photography" in the present and last volume of the PHOTOGRAPHIC NEWS, and an article on the "Photoheliograph," in last volume. Another article on the subject will probably appear shortly. With your camera extended about 12 inches beyond the eye-piece, you should get an image about 3 inches diameter.

W. D.—Fenton's view of Furness Abbey, No. 22, in the Photographic Exhibition, is also exhibited in the Architectural Photographic Exhibition; and the number, so far as our memory serves us, is 211. 2. Leake's tent usual size, is scarcely large enough to manipulate plates 12 by 10; but we believe larger sizes are made. 3. The new triplet decidedly. The other lens you name gives serious curvature of lines; the triplet quite straight lines. Two negative lenses are now supplied with the latter: one for copying purposes giving a perfectly flat field; and one for landscape work with a little rounder field. For architectural views, chiefly on one plane, use the copying combination; for others, the latter combination. We like Kinnear's camera; but care is required to fix it so that the lens and ground glass are quite parallel.

JIMBY.—The fault is in your paper. See Mr. Hughes' article, and the discussion at the Photographic Society in present number. Use your toning bath a little more dilute, so as to tone more slowly.

THOS. W. B. COOK.—The best plan is either to use a number of dark slides to contain a sufficient number of plates, or to use a transferring box for changing the plates. Such boxes are made, we believe, by camera-makers generally; we have seen them at Mr. Meagher's establishment. We shall have pleasure in introducing you. The subscription is half a guinea.

T. M. G. has succeeded very well with the hot-water process, with the exception of being troubled with small round transparent spots. Can any of our readers help him?

J. B. ROBINSON is thanked for his communication.

A SUBSCRIBER FROM THE FIRST.—Your scrolls will not stand damp without some varnish; but we do not remember any varnish that will be sufficiently transparent and at the same time without gloss. Almost any varnish will do, but a soft one such as mastic will be least liable to crack. The addition of a little white wax will prevent excessive gloss.

W. L. C.—Salt or chloride of sodium will not precipitate silver from a solution containing cyanide of potassium, as cyanide dissolves chloride of silver. The plan given in our last, is the best for a mixture of all residues. The spongy mass or globules may be fused into one lump, but it is not necessary, either for sale or for convertion into nitrate.

X.—We will enquire.

LEO. DAFT is thanked.

F. RICHARDS.—We will communicate by post.

F. G. G.—Use nitric acid to your positive bath. The amount will depend somewhat on the strength of the bath. If you add too much, the sensitiveness will be diminished. If your bath have 35 grains of silver to the ounce, about half a drop of nitric acid may be added to each ounce of solution. Add a little less at first, and then try a plate.

Several correspondents, whose letters arrived late, and Mr. Lane's communication in our next.

Advertisements and Communications for the Publisher for the current number, to be addressed to the Office, 32 PATERNOSTER Row, not later than 3 o'clock every Thursday. Post-Office Orders are to be made payable to Mr. THOMAS PIPER, at the Money-Order Office, St. Martin's-le-Grand.

THE PHOTOGRAPHIC NEWS.

VOL. V. No. 128.—*February* 15, 1861.

THE PHOTOGRAPHIC SOCIETY OF LONDON.

THE Report of the Council, and the Financial Statement of the Photographic Society will be found in another column. Neither of these documents are suggestive of very pleasant contemplations, nor can we congratulate the society—nor photographers at large, as interested in its stability and progress—on the results of the year as indicated in these documents. Unwilling, however, as we are to enter into the subject, there are one or two points connected therewith, bearing on subjects of general interest, that call for brief observation.

A word in passing is due on the unseemly altercation which arose at the annual meeting on Tuesday week. As our readers will see on reference to the report of the meeting, published in our last, that when the report was read, the chairman invited comment or questions upon it from the members. We presume that by this comment was meant eulogy, for the moment that Mr. Malone began to question the truth or propriety of some of its statements, he was met with the most energetic interposition of the chairman, who distinctly told him he would not permit such observations to be made.

Mr. Malone's protest against the report, we conceive, to be a most legitimate one. Amongst the events of the year, forming, with the greatest propriety, a subject of allusion, and an occasion of graceful eulogy, was the death of the late Mr. Peter Fry, one of the earliest members and chief promoters of the society. But that in passing a just tribute to the dead, opportunity should have been siezed in the report of a scientific society to offer a direct and most uncalled-for affront to a living gentleman, and one to whose researches the art and science is perhaps more indebted than to any other man alive, is a circumstance that we must confess we cannot reconcile with our ideas of propriety and decency. We are not about to seek up or uncover old sores, nor to enter into the slightest discussion of the claims of Mr. Fox Talbot. The subject was long since dead and buried, and it might reasonably have been hoped that all the rancour and heartburnings arising out of it had been entombed with it. We cannot but regret the singularly warped ideas of propriety which could induce the Council, in referring to the departed gentleman, to occupy a large portion of the report in connecting his name with some of the most painful events in the history of the science he loved, and endeavour to make him, from his ashes, subservient to the purpose of branding a stigma on a name so illustriously connected with the most important discoveries in that science.

Mr. Malone, we repeat, was not only in order, but, connected as he was with the proceedings referred to, and holding the opinions he was known to hold on the subject, he was bound in common honesty to himself, and those with whom he had been associated, to enter his protest against these clauses of the report. The attempt, under such circumstances, to silence him by the use of a musty Latin proverb, and by stigmatising the good taste of his protest, was most unjustifiable. If correct taste decide that nothing but good shall be spoken of the dead, it should likewise decide that the same immunity should be extended to the absent, and we think also it should decide, *à fortiori*, that the dead be made not a shield from behind which to stab the living. Mr. Malone might, therefore, with great propriety, have flung back the charges of bad taste; and we think if he had moved an amendment to the effect that the paragraphs referring to Mr. Fox Talbot be struck out of the report, he would have carried the sympathies, if not the voices, of a large portion of the meeting. In one point the propriety of his protest lies already acknowledged by the Council, for it will be observed, on referring to the published report, that the terms to which Mr. Malone took especial exception when it was read, are now expunged from the paragraph referring to that subject.

We must repeat that in making these remarks we do not revive the question of Mr. Talbot's rights, nor in any sort either affirm or deny them. The subject is a wide one, involving many considerations, and admitting of much argument on both sides. It affects no interests now—let it rest in peace.

Another startling feature of the report, or rather of the financial statement, is the fact that there is during the year an excess of expenditure over income of between three and four hundred pounds. During the last few weeks there have appeared in our pages letters from various correspondents, urging the necessity for some reform in the constitution or management of the society. We are by no means necessarily identified at any time with the opinions of our correspondents. Occupying an independent position, and not the organ of any society, or section of photographers, our columns are at all times open to temperate and intelligent discussion on all questions bearing upon the interests of the art or its votaries. We do not necessarily endorse all the opinions of these correspondents, therefore, when we point to this one startling fact, as corroborating, in a forcible manner, the importance of this call for reform; we may add that this call does not simply emanate from the few correspondents whose letters have been published, but finds an echo in private letters we have received from many of the most eminent provincial artists and members of the society, and in the conversations we have had with gentlemen occupying the very highest position in connection with the art in the metropolis.

We should regard it as a very heavy blow and great discouragement to the art generally, and as a circumstance, the depressing influence of which can scarcely be at present estimated, if the Photographic Society of London — of England we may say—were to cease to exist. Nothing else which could arise in its place could possess the same prestige, or exercise the same influence. To repeat the remarks of "Progress," "No society can be compared with ours for the advantages it possesses. It is the oldest, the largest, and the parent of all others. It is patronised by royalty, graced by nobility, and made illustrious by distinguished members. It established the first journal exclusively devoted to our art, and by its successive, annual exhibitions gave that impetus to photography that has made it what it is. And shall a society like this die out, when small provincial and suburban societies are full of life? Nothing is wanting but skill and energy to make this Society greater than ever it was." We fully endorse these remarks, and yield to no man in a desire to see this greater prosperity. But if this deficit in the material sources of prosperity occur many years in succession it does not require a prophet to foretell the result. We do not here enter into any examination of the causes of this excess of expenditure over income, and we are aware that now is not the time for specific steps of any kind as affecting the constitution or goverment of the Society; but it is while facts of this kind are fresh that a public opinion may be created, which, by its pressure from without, may exercise an influence which may save the Society from that atrophy to which it seems in danger of falling a victim.

In concluding, it is unnecessary that we should do more than briefly refer to some comments in the columns of a contemporary on the first letter of "Progress," which is regarded as an "anonymous attack," or a "stab in the dark." If it were necessary to seek for an answer to our contemporary's defence of the Society, we could very easily select from his own pages strictures infinitely more denunciatory of the proceedings of the Society than anything in the letter of "Progress." The simplest answer is found, however, in the article which this letter has drawn from our contemporary. He says "the meetings of the Society are always interesting *when* the best men take the trouble to attend." This very introduction of the conditional mood implies perfect coincidence with the views of "Progress," who complains that they *do not* attend. Our contemporary then proceeds in detail to state how "first-rate men have been kept in the background," and further, what "ought to have been done," &c., &c., in all of which he confirms, so far as he goes, the views put forward by "Progress."

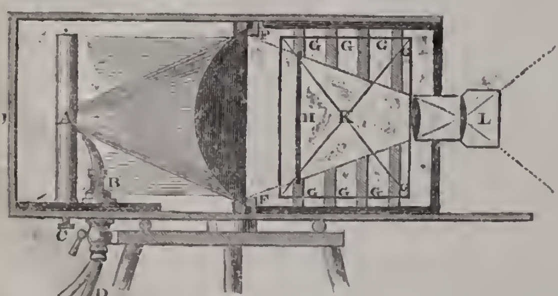
In regard to the question of anonymous writing on such a subject, the canons which should govern such matters perhaps are not very well understood, but to every honest journalist they should be as clear as we think they are simple. Anonymous comment on matters of public interest so far from being un-English, as our contemporary asserts, is pre-eminently an English practice, and is carried out almost universally, not only in English journalism, from the *Times* downwards, but in what is considered the highest order of periodical and critical literature, the various Quarterly Reviews. Where comments are made on any matter of public interest, if those comments are just and true, they need not the aid of a name or personality to give them weight. If they are fallacious or dishonest, they would gain nothing from the endorsement of any personality. Where private interests of any kind are affected, whether they concern a man's good name, or his trade wares, then we agree with our contemporary that anonymous attacks are altogether unjustifiable, and the insertion of them would be most reprehensible. If an individual be attacked, his assailant is a coward if he wish to fight under a mask. To such assassination our columns shall never be open.

The letter of "Progress," whom we know to be one of the oldest and staunchest friends of the Society, was in no sense a "stab," still less a "stab in the dark." Our esteemed contemporary, the Editor of the *Notes*, has here scarcely combined his customary clear vision with his refreshing plain speaking.

THE LIME LIGHT:

Its Application to the Solar Camera.

The annexed sketch shows the method in which the lime light may be adapted to the solar camera.



The bottom of the camera is partly cut away to allow of the lime-light lamp being slipped into it without removing the stopcocks.

The bottom of the lamp is shown by a black line.

A is the lime light, which may have one or more jets attached to it, or several lamps may be fitted in a line with each other; B, the blowpipe: C, the screw for occasionally raising the lime so as to present a fresh surface to the action of the gases. This screw may be made to fit so nicely as not to interfere with the steadiness of the camera during adjustment; D shows the position of the stopcocks and supply pipes; E the condenser which fits against a wooden bed, and is retained in its position by the wooden clamps F F, which turn on the screws or pivots by which they are fixed upon the bed of the lens. G G G G are the separate sized holders for the negative about to be copied, which slides into them in grooves made for that purpose. They are fixed to that part of the camera holding the portrait lens as shown by a black line reaching up to the nuts F F. This part of the camera is made to slide out bodily to enable the operator to place the lime light on this side the condenser, if he wants to use the light in parallel rays for printing, &c., &c. The bottom of this part of the camera will also have to be partly cut away to allow the admission of the stopcocks. It is extended for the purpose of allowing the lamp to be placed in the focus of the light, the distance of which from the condenser is exaggerated in the drawing the more plainly to show the principle of the whole arrangement. This sliding portion of the camera will also have to be partly cut away on that side which is next to a door shown by diagonal lines intersecting each other at K. Another door is hung at the back of the camera at J, for the admission of the lamp. In this door is a strip of dark *purple* or blue glass, sufficiently broad to enable the operator to see to adjust his lights to the greatest degree of brilliancy and *whiteness*. This is easily done after a few trials by observing the reflection of the flame upon the condenser. The inner part of this chamber may be lined with tin and should have a kind of magic-lantern chimney to carry off any unnecessary degree of heat which is sure to be created in so small a space.

The whole arrangement may be placed on a table, or on four legs of its own, or on a tripod stand as desired.

S. S. B.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Antiquities.—This word explains its meaning. The time is passing away in which the antiquary was regarded as an idle and eccentric personage, delighting in musty old records, and dusty old relics—a very harmless, useless, and peculiar specimen of humanity, and a capital butt for ridicule. The final exit of such a stupid, shallow-pated time must be hastened by photography; the art which brings to every home these long-enduring, but fast-decaying, witnesses of ancient and modern history, witnesses which, uninfluenced by imagination or prejudice, illustrate wonderfully the most interesting of historical facts, verify dates, correct errors, detect imposition, explain mysteries, and recreate in living reality those dim periods of the past which, to every thoughtful mind, have such intense interest and high importance. The antiquities of his country must possess a rare charm for every patriotic man who can exclaim in the language of rare old Spenser—

> "Dear Country! Oh! how dearly dear
> Ought thy remembrance and perpetual band
> Be to thy foster child, that from thy hand
> Did common breath and nouriture receive!"

It is often a subject of regret with me that in this important and interesting branch of our art we have, in comparison with its value, so few workers. How many fine antiquities and monuments, now never seen save by the privileged few, are still to be reproduced by photography and made public, to the enlightment and improvement of both the casual reader and the earnest student. Truly photography has yet to be properly appreciated in all the wondrous diversity of its applications. Antiquities, in an artistic sense, will, of course, refer purely to relics of ancient art; but I thought it well to point out briefly the importance of the word in its more extended sense in connection with photography.

Anatomy.—Photographers who emulate such ambitious aims as the works of Lake Price and Rejlander frequently display, should certainly possess some knowledge of this branch of art. Muscular action is the painter's chief vehicle for the display of every predominant passion and ruling emotion of the mind; and it is to his anatomical knowledge that he looks for the proper expression, rather than to the mimic powers of his model. It is seldom, indeed, that the actor can, by the mere effort of his will, bring into play all the muscles which by their action indicate certain conditions of the mind; but when that actor's feelings are wrought up to the desired pitch, then, without a thought, without the slightest desire for securing any outward sign, every active muscle becomes full of forcible expression, and the passion speaks out from every part of the model's exposed frame. To recognise the various combinations and different degrees of intensity of the passions as expressed by muscular action, in order to reproduce them in his productions with due force and truth, it is evidently necessary that the photographic artist should understand that portion of this science which is generally studied in connection with pictorial art. Save in cases of an accidental or extraordinary character, it is no use telling your model to look as if he felt this or that; and it is not always that you can so work upon an *ordinary model's* mind as to bring certain muscles *instinctively* into play; but when you understand how and to what extent muscles act under a certain influence, the model may be educated with more success than is commonly believed to express outwardly the inward emotions and passions of our nature. That this could be accomplished I did not myself believe, until the works of Rejlander converted me; for from *some* of his models he has secured that force and effect of muscular expression which few painters have equalled, and none surpassed. I have not now the necessary time or space at my command, or I would here give a few rules for those who are ambitious of excelling in anatomical expression. "Le Brun's Passions" is a good work on the subject, notwithstanding many faults; although I do not think invariable rules can or ought to be laid down for the government of expressions subject to so many influences. A good and useful work might be written upon this branch of photographic art, but its practitioners are so few, and their efforts so partially appreciated, that such would not now perhaps meet with the encouragement it would deserve. Many will, perhaps, even condemn these one or two meagre hints, as calculated to lead the ambitious astray; but let such only look over a folio of Rejlander's picture photographs, and if they do not bring them to another way of thinking, I am no conjurer, nor they unprejudiced observers.

Arrangement.—Artistic arrangement comprises composition, chiaroscuro, symmetry, and almost all other qualities which give picturesque value to an art production. In the arrangement of light and shade, different eminent masters have adopted different methods, but they all tend to a similar result, viz. breadth of effect. Some endeavour to get their general mass of shade of a wedge-like form, the base being at the side of the picture and the apex near the horizon; such an effect is commonly found in the works of Stanfield, Collins, and others. Some have treated the mass of *light* in precisely the same way, and obtained very excellent effects. A few of Rembrandt's paintings are so treated. The general mass of light or shade may take any form, providing it be agreeable and in keeping with the sentiment of your picture. The relative proportions of light and shade are of course dependent upon the general effect desired. The most common arrangement of lights and darks is to be found in the old principle of three lights so placed as never to indicate a straight line in any direction, varying in shape and degree of brilliancy, and forming, if connected by lines, an unequal triangle. This principle may be seen skilfully carried out in most of our modern masters' pictures. It is somewhat complex, and not always within a photographer's grasp, unless it be in portraiture, when the head at once forms the principal light, and the hands those which act as a base to the pyramid; when these three lights should receive the treatment above described. A favourite arrangement with Turner was that given by a dark tree, or similar object, reared against a luminous sky, and repeated by some dark spots near or in the foreground; these darks being connected by a mass of middle tint. I have seen a very similar effect in some of Wilson's glorious stereographs of sunsets. The relieving of a dark mass against the pictures' most brilliant light produces very powerful and picturesque effects *when well managed;* but the danger in unexperienced hands lies in the probability of a spotty and unpleasant effect resulting from the attempt. *Such arrangements must always be subject to the attainment of breadth,* without a proper knowledge of which your management of light, and shade, or chiaroscuro, will seldom chance to be artistic. Avoid getting the mass of light or dark in the centre of your view. In a well arranged picture, every line, whether it bound masses of light or dark, or indicate form only, must be considered in reference to the whole. Certain shapes, as indicated by lines, must be avoided, viz. such as are formal, too regular, or angular. Masses of mere light and shade should always be more or less indefinite in their forms. If your view embraces objects having many horizontal lines, take especial care to select such a point for your camera as does not make them appear parallel; either by throwing them into perspective, or picking out some spot which breaks them by an intervening object, or availing yourself of some other happy chance. Variety of form must be eagerly sought upon all occasions, for contrast is the parent of vigour. Never let the principal object in your view stand exactly in the middle of the picture; nothing looks uglier than a photograph of some one object so exactly dividing the space in which it is placed that you cannot help fancying the compasses were used to ascertain its exact position. This is a very common fault in photographic portraiture. When taking a street scene or avenue of any description, be careful that the point of sight to which the objects on either side converge do not fall exactly in the centre of the horizontal line. In such a selection, too, the light should not be so situated that both sides are equally illuminated. When any two objects of uniform appearance stand together, choose that point of view which will not render them at equal distances from any one other object; or from the sides, base, or top of your photograph's boundary lines; and choose that, also, which will give them with as much difference of shape and light or shade as it is possible to secure; uniformity being no friend to the picturesque. In a portrait of any kind, let the figure be a little to the right or left, never equidistant from the sides, and keep more space above and before, than behind or below it. This too is a rule of arrangement very commonly violated in photography. In photographing a single head it is often permissible to place it at equal distances from the sides, but then it must not be the same from the top and bottom. All these methods of arrangement must be consistent with *Keeping,** with *Variety,* with *Breadth,* and with *Contrast,* which latter is the parent of *Force* and *Brilliancy.* See also *Composition* and *Chiaroscuro.*

Artilise.—A capital word, which I think deserves retaining. We find it used in a remark of Montaigne's, who says, "If I were a philosopher, I would naturalise art instead of *artilising* nature." "The expression" wrote Bolingbroke, "is odd, but the sense good." To "naturalise art" is one of photography's missions.

* That is to say, you must not in aiming to carry them out destroy the consistency or truth of the whole.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

Having in our previous chapters described the best methods of preparing nitrate of silver, we shall now proceed to the next subject on our programme, and consider its properties. In the crystalline state it forms transparent and colourless plates belonging to the right prismatic system. When heated to a temperature below redness it fuses readily without decomposition, forming a clear liquid which solidifies on cooling to a white, hard, fibrous mass. Its aqueous solution does not redden litmus paper, as is usual with the nitrates of the heavy metals, but, on the contrary, is said to have a slight alkaline reaction. It has a bitter, disagreeable, metallic taste, and acts as an acrid poison if taken internally. It destroys organic matter if exposed to the light. In 100 parts it contains 63·52 parts of metallic silver, 100 parts of metallic silver yielding 157·4 parts of nitrate of silver. It does not blacken in the air, or light, except when in contact with organic matter, or gaseous exhalations. Heated to redness it decomposes, yielding metallic silver and various gases. Thrown into red hot coals it detonates, and takes fire when mixed with powdered charcoal and struck with a hammer. Heated to fusion with zinc or copper it decomposes, but suffers no change if fused in perfectly clean iron vessels if no water is present. Placed in contact with copper, even in the dry state, it is reduced to metal, a change which also takes place if kept wrapped up in a paper for any length of time.

Nitrate of silver dissolves in one part of cold, and half a part of boiling water, the excess crystallising out on cooling. It dissolves also in four parts of boiling alcohol, the greater part, however, separating on cooling. It is insoluble in strong nitric acid, and is precipitated by that acid from its aqueous solution. It forms a crystalline salt with iodide of silver, and in strong solution dissolves considerable quantities of that and other insoluble silver salts.

From its aqueous solution iodide of potassium throws down all the silver in the form of an iodide, which is very sparingly soluble in excess of iodide of potassium, and almost insoluble in nitric acid or ammonia, which latter, however, turns it white. When the silver solution is so dilute that one part only is contained in 30,000 parts of water, this reaction ceases. When the iodide is dissolved in 500 parts of water, it gives a yellow precipitate with nitrate of silver; in 5000 parts of water a yellowish white precipitate; in 50,000 parts of water a white turbidity; and in half a million parts of water a scarcely perceptible opalescence. A soluble chloride, or hydrochloric acid, produces opalescence in a solution of one part nitrate of silver in 120,000 parts of water. This is scarcely perceptible if diluted 400,000 times, whilst if diluted 800,000 times, the an opalescense does not show itself for a quarter of an hour. The photographic properties of nitrate of silver are too well known to need further notice at present.

The adulterations, intentional or accidental, of this important chemical, are next to be considered. Nitric acid is a very common ingredient of the cheaper varieties, and may easily be detected by the smell. Some varieties of commercial nitrate of silver contain so much of this impurity as to corrode the corks of bottles in which they are kept. The remedy is to heat in a water bath, as previously recommended in the preparation of the pure salt, until all acid smell has disappeared, and then to recrystallise. Nitrite of silver is also very liable to be present on the fused compound being produced, if the heat has been rather too high in this operation. It may be removed by adding a little pure nitric acid to the aqueous solution, boiling down till it is nearly dry, and then heating on the water bath till quite dry and free from acid.

Organic matter of different kinds is very frequently an impurity in the commercial salt. It finds its way in from a variety of causes. Mr. Hardwich states that silver reduced from the chloride may contain organic matter which ultimately finds its way into the nitrate of silver. The remedy for this is to fuse the silver, or at least to raise it to a red heat in the air before dissolving it in nitric acid. In the solution of silver on the large scale in nitric acid it is sometimes customary to throw lumps of charcoal into the liquid when heated, in order to prevent concussive ebullition, which might endanger the safety of the vessel and its contents. Nitrate of silver thus prepared is valueless for delicate photographic purposes, until it has been purified by fusion and crystallisation.

Nitrate of copper may find its way into the silver; nitrate if the latter is prepared from the standard alloy. This may be avoided by taking more pains in the preparation to prevent the copper from remaining with the silver. If the salt, after evaporation to dryness, should, however contain copper, which may be known by its having a green tinge at the edges, the best plan will be to fuse the salt at a temperature a little below redness. The nitrate of copper is thereby decomposed, leaving black oxide of copper, this may be separated by solution in water and filtering; the filtrate after addition of nitric acid may be evaporated to dryness and heated as above recommended.

Amongst intentional adulterations we may mention nitrate of potash, nitrate of zinc, and nitrate of lead. These may be detected in the following manner:—Dissolve a drachm of the suspected salt in half an ounce of distilled water, and add pure hydrochloric acid until no more precipitate is formed, agitate well and filter off. The solution will contain the hydrochloric acid which has been added in excess, free nitric acid resulting from the decomposition of the nitrate of silver, and the nitrates which have been used to adulterate the silver salt with. This may now be evaporated to dryness, and if any solid residue is left it shows that an adulteration of some kind or other is present: in this case it will probably be thought advisable to ascertain what it is. It must, therefore, be dissolved in water, and have a drop of dilute sulphuric acid added to it, when, if a white turbidity is produced, it shows that nitrate of lead has been the adulterant; in this case add more sulphuric acid until no more precipitate is thrown down, and, after agitating the liquid again, filter it into a clean glass. If, however, no precipitate has been produced by the sulphuric acid, it need not, of course, be filtered. In either case evaporate the solution to about one-fourth of its bulk, and then add ammonia until it is in slight excess; then add a few drops of sulphide of ammonium, and if a white precipitate be produced it shows that nitrate of zinc has been present. If no precipitate, however, appears, evaporate the whole to dryness and heat the residue to dull redness until no more white fumes are given off. Any residue remaining behind, which will not volatilise at a temperature below redness, will show that an alkali is present. probably potash, showing that the silver salt has been adulterated with nitrate of potash. If the latter impurity only is present, the silver salt may still be used for making the sensitizing solution for positive printing. The only effect which it will have being to diminish the amount of silver present, which must be allowed for by taking more of the salt. It may also be used for making the nitrate bath for all except the most delicate processes. If nitrate of zinc be present, the salt will be fit for positive printing purposes, but will not be so suitable for the collodion process. Nitrate of lead and nitrate of copper will each of them render the nitrate of silver unfit for use in any photographic capacity, and it should either be returned from whence it was purchased, or purified. We have already explained how to separate copper from it. The separation of lead is a matter of more difficulty, the best plan will be to dissolve in water and precipitate the silver in the metallic state by means of a sheet of copper. The resulting silver must then be well washed to free it from adherent copper and lead salts, and then fused or heated very strongly in the air. It may afterwards be converted into silver nitrate as explained in former chapters.

DISCUSSION ON ALBUMENIZED PAPER AND ALKALINE GOLD TONING.

OPENING PAPER BY C. JABEZ HUGHES.*

The principal troubles met with in alkaline gold toning may be embraced under the following heads:—

Weakness and flatness of image.
Mealiness.
General greyness of tone.
Red spots and streaks.
Blisters.

Weakness and flatness of image is generally caused by the negative being deficient in contrast.

One peculiarity of toning by this method is, that a good print can only be obtained from a *good negative*. By the old method, a passable one could be got from a weak negative, by over-printing and reducing in the toning.

Generally, however, a weak and flat appearance is indicative of the silver solution being too weak. This use of a weak silver solution is one of the greatest causes of trouble. I take this opportunity of urging, as I have already done elsewhere, the use of the little instrument known as the hydrometer silver-tester, for estimating the amount of nitrate of silver in solution, every morning before sensitizing paper. No person knows, unless he has tested how rapidly the silver is abstracted from their bath by sensitizing paper. If objection be made to the instrument I have named, then use one of the other argentometers; they are all good and efficient, only do use some one of them.

A general greyness and coldness of tone.—Over-toning is the general cause of this. Not being exposed long enough in the printing frame, and being kept too long in the toning solution, will always produce this effect. The remedy is obvious. Papers excited on weak silver solutions have a constant tendency this way. Some papers are more subject to it than others, and on some Saxe papers it is too easily produced. Rive papers do not go into the inky tones, but adhere to the purple brown tints.

A general mealiness.—This at first sight appears to be a defect in the albumenizing, and yet it really is not so, for neither the albumen or the albumenizer is at fault, but the plain paper. It took me some considerable time to establish this fact, but I am quite convinced of it now.

This defect exists principally in coarse paper. When laid on the albumen it absorbs it unequally, and when dried the surface is seen full of small hillocks and hollows arising from this unequal absorption. Now as the gold requires a uniform surface of albumen to produce a uniform tint, it is seen that it cannot be obtained here, for the valleys, so to speak, tone first, and as they have less albumen on them, they are finished before the hillocks scarcely begin; the print taken out at this stage is covered with minute red spots of untoned albumen; now let it be replaced, and the toning continued till these spots are the desired colour; by this time the valleys are over-toned and have turned to a lighter grey, and the picture has that unpleasant speckled and dotted appearance, as if it had been dusted with fine flour, and in rubbing off, it had got ground into the pores of the albumen. Paper having this defect should be condemned, as, although it may be modified by manipulation, it never gives good pictures. *Rive* paper is very rarely subject to this objectionable peculiarity.

Red spots and streaks.—These are often caused by the paper being badly albumenized, and are then defects of manipulation; but they are often to be attributed to irregularities in the surface of the primitive paper, some parts absorbing more than the rest, and in toning, as the gold changes the colour just in the proportion of albumen present, so the difference of colour produced registers the exact amount of albumen, the red spots, lines, and patches shewing the irregular amount of albumen present. Remedy: better paper.

Blisters.—The defects hitherto pointed out belong mainly to German paper, but blisters are more prone to the thick Rive papers. The albumenizer is often charged with these, as though they were his fault. He is no more accountable for them, often much less, than the person who uses the paper. They range in size from a pin's head to a marble, or larger. They may be found in any very highly albumenized paper, and *only* in that description, and are less frequent in thin than in thick papers, being scarcely ever found in thin Saxe, and most abundant in thick Rive. These blisters usually take an oval form, and seem to be formed by a gas being generated in the body of the paper, which by its dilation, causes the soft and elastic albumen to expand also. The paper however splits into two layers, one portion remaining attached to the albumen. As a rule the greater the relative amount of carbonate of soda present, so is the tendency to blisters. Many papers will blister when a large quantity of the carbonate is added to the gold, which, if the latter be used acid or neutral, will not blister at all. This quite favours the idea already named as to their probable origin, for if the soda base unite with any of the acid sizing material in the body of the paper, the carbonic acid in struggling to escape would cause the distension of the albumen surface, and thus obviously explain the presence of blisters. They generally go down in drying.

I think I have pointed out the principal defects complained of, and apart from ourselves and our own defective manipulation, the great cause of the difficulties lies in the very plain papers themselves.

Those who albumenize paper must endeavour to have some control over the sizing, so that they may guarantee a more uniform article. Many persons think that the faults lie with the individuals who albumenize the papers. This is a mistake. These persons, when they prepare a large batch of albumen, float thin and thick paper, Saxe, English, Rive, all on the same albumen, in fact, treat them all alike; but the papers, as you know, all give different tones. Much less is in the albumenizer's domain than is supposed. Speaking of albumen, there are many false notions extant. Gelatine, dextrine, gum arabic, &c. are supposed to be added to albumen to increase the glaze; and many faults are attributed to these sources; whereas I believe that no substance whatever, chloride and acetic acid excepted, is added to the albumen, in this country at least. The cause of those bad smelling papers is decomposed albumen, than which few things have a more fœtid odour.

Not long since, one gentleman, who ought to have known better, burst forth with a grand panacea for all our troubles; a something which, if added to our albumen, everything was to go right, and without it all formulæ were hopelessly wrong. After this grand flourish of trumpets, and when on the tiptoe of expectation, we were told to wait a fortnight —a whole fortnight of anxious suspense, for the secret was too great to be hurriedly told—when, wonder of wonders, the mountain commenced its labours, and, *a few drops of acetic acid* oozed out. This, added to albumen, was to be a cure for all the ills albumen was heir to. Jesting apart, for the matter can only be so treated, despite the oracular method of its utterance, and the ponderous effort to astonish the world whatever small merit the addition of acetic acid to albumen may have, has long been known and is constantly practised. It does aid in producing limpidity, and, perhaps, tends to keep the whites clear, but it is so utterly inefficient to cope with the greater difficulties already named, that, while acknowledging its humble aid, all its extraordinary merits I dismiss to the safe keeping of the gentleman who made the discovery.

In leaving the matter in your hands, for I have only attempted to open it, allow me to say, that although we have troubles with our paper now, we are not peculiar, and need not despond, for troubles with paper have always existed. In early calotype days the cry was, where can we get good paper? The present are not the first complaints on printing. When the first novelty was past, producing prints at

* Continued from p. 67.

all, complaints were made of the foxy hue and dead sunken-in effect of our prints. Albumen was then introduced to give a finer surface and greater brilliancy. This was all very well, but there remained the odious colour, something between brick-dust and gingerbread, when that awful mystery of "toning" was invented, and we first got glimpses of that "beauty which only leads to destruction." During that brief period how we revelled in our new-born powers. Who would not be a photographer to produce such tones, such blacks, such whites? You remember that famous "Crucifixion." What a delusion we laboured under then? It was as though we had bargained with the Evil One to have temporary good for permanent ill — selling for fleeting beauty all future permanence. It was an awful "sell," that villainous mixture of sulphur and acid, and hypo and gold, and silver and chloride, and nitrate, and—what not. That ominous black pool, thick with ooze and slime, and fearfully suggestive, by its very brimstone smell, of the dreadful fate reserved for the young print, just fresh from the printing-frame, full of its fresh purple beauty. See, it takes the fatal plunge deep into this black ditch, and when we see it again, its virgin charms are all gone; wan and pale, disrobed of its early attractions, there, in that dark pool, it must in penance lie, till, forgetting its former self, it emerges, sallow in hue, black in shadow, a delusive beauty in its face, disease at its heart, a mockery, a delusion, and a snare, and fitting triumph of the demon—Sulphur.

Let us hope that these times are all past, that, in a photographic sense, the golden age is at hand, when our beauties will be as permanent as they are true. It is true some few of us still linger and look back fondly at the good old hypo times, who are sceptics as to the "good time coming," who sigh for the flesh-pots of Egypt; as an off-set to these—the archæologists of photography—let us point to the noble monument existing in the present Photographic Exhibition, where the few sulphur-toned prints present show up, by very contrast, the splendid success of alkaline gold toning.

Photographic Tourist.

PHOTOGRAPHY IN JAVA.

ACCOUNT OF A SHORT PHOTOGRAPHIC RAMBLE THROUGH THE INTERIOR OF THE EAST END OF THE ISLAND.

With our minds elated by the prospect of a pleasant trip, through the wildest and most beautiful scenery of Java, and with a first-rate supply of apparatus, including one of Smart's dark tents, which we had just received by mail from England, and in which we anticipated pleasant working, we (a party of three) started from Kedirie, an inland town of Java, at the close of a hot day, for a sugar station about eight miles on our road, and arrived with the decline of daylight at this, our stopping-place for the night.

The scenery on the way so far (the road being principally through a flat country composed of tawahs, or rice fields), presented nothing of interest to us in a photographic point.

Our host, Mr. Boyd, a Scotsman, received us with true British hospitality, and after entertaining us with all the amusement the place could afford in the shape of two dancing-girls, whose monotonous and unmusical voices soon wearied us, we (it being a fine moonlight night) proposed to take a stroll, but were prevented by our host informing us that the neighbourhood, within a few yards of the gate, was infested by tigers, so, after a long conversation on the dangers of the place, we retired for the night.

By daylight next morning we started off our coolies with the traps, but being a wet morning we delayed our departure till later on in the day, and after thanking and bidding adieu to our kind host, we started accompanied by eight or nine Javanese, mounted on horseback, as, having to pass a celebrated tiger haunt, it was not considered advisable to allow us to travel alone. The wildness of the place, being through tall jungle grass some twelve feet high, and so thick as to prevent the possibility of seeing more than a yard into it, and with the name it had got, altogether made this part of the journey rather exciting, even the horses seemed to have an instinct of danger.

After a cool ride through deliciously shaded coffee gardens, filled with monkeys and wild pigs (which from their impudence might well have been mistaken for tame ones), we arrived at Paree, where it was our intention to stay for a few days, having heard of some ruins in the neighbourhood, there also being a pasangrahan, or house kept by Government for the accommodation of travellers, where we could make our home for a short time.

The first object of interest which attracted our attention on arrival was an immense specimen of the Waringhin tree, in height about 180 feet, and covering with its shadow a diameter of 150 feet, planted in front of the pasangrahan, and offering a fine subject for the lens, though on trial we found that from its immense size it was impossible to recede far enough away from it to receive it on the plate, even with a lens embracing a large angle.

This was our first trial of Smart's tent, and as we had previously worked in a native-made affair, found everything very convenient, and easily put up or taken down; the only thing that might be improved is the window, which, owing to its being placed too high, makes the development of negatives rather difficult, the light falling *on* the plate from above, instead of *reaching it* from *below*. The india-rubber folding-tray and washing-bottle will not stand long in this place, as on opening them they are generally all stuck together, and are with great difficulty separated. The tent is as good as can be desired for working wet collodion, with these exceptions, the latter of which would probably not occur in an European climate.

On the morning after our arrival we were waited upon by the chief of the village, to whom we expressed our wishes regarding his assisting us with men to enable us to find the ruins; after arranging everything for the journey to one of the temples he left us, and on the following morning we started. Our way lay through a forest such as we had never before seen in Java, lofty trees, each composed of hundreds of stems twisted together, and at no great height branching off into the most fantastic shapes, throwing down feelers similar to the banyan, others so covered with the most beautiful parasites as to hide altogether the stem from which they sprang; the ground below so overgrown with ferns and an endless variety of small bushes, and the air of gloom and quietness that hung on everything, even though in the middle of the day with the sun at its greatest power, altogether formed a scene long to be treasured in our minds.

After a ride of two miles into the thickest part of the forest, through the narrow horse-track made by the natives, we arrived at the temple, which (though interesting, and covered with many fine carvings) was so hemmed in by trees as not to allow of a single point of view; so we returned, not however without having picked out a lovely bit of forest scenery on the way, which we determined to return and photograph the following day.

At eight o'clock the next morning we were on the desired spot (the coolies having gone on before us), and after pitching our tent proceeded to select the best point of view for a small rivulet prettily overhung by ferns and hanging rattans, making a nice picture; owing to the extreme darkness of the forest, on looking at the ground glass, it was almost impossible to distinguish any image, even using a half-inch stop, making it very difficult to focus, (I am now speaking of a view camera 7 × 9).

The first plate was exposed three minutes, but was much underdone for a negative, though in ordinary circumstances, and a well-lit view, fifteen seconds would have sufficed; by the time the next plate was prepared the sun had emerged from a cloud behind which it was previously hidden, therefore throwing a nasty glare on to one part of the view, putting the other by contrast into perfect darkness. I may here mention that having, in a country like this, to deal principally with foliage, we have found that to get anything like softness pictures must be taken in the shade, as where the leaves happen to be turned to the sun the consequence is a dense patch in the resulting negative; the glare of the sun, especially after nine in the morning, being so very dense, a large proportion of bromide in the collodion is also necessary to ensure softness.

This being the case, and having pitched our tent in a spot where there was no chance of a ray of sun penetrating, we sat down on a bank and waited patiently till that luminary should again be obscured, in the meantime amusing ourselves by watching the gambols of a troop of monkeys perched on a tree over-head, who, from the manner in which they regarded us, seemed to be much interested in our proceedings; a number of peacocks were also visible at a short distance.

The desired moment having at length arrived, we proceeded to try again, and this time succeeded in obtaining a perfect negative, though with the long exposure of five minutes; after taking a stereoscope of the same subject, we proceeded, during the interval of cloudiness, to take another view in the forest much more extended, which also turned out satisfactorily, and, being much better lit-up, was done in forty seconds, giving an opportunity of introducing the figures of two Javanese.

After having obtained four good negatives, two large and two stereoscopic, we packed up our tent and returned to breakfast at the pasangrahan, during our stay at which place we amused ourselves in the evening by shooting, there being plenty of game, including deer, wild pigs, peacocks, and many other birds, always taking care not to be out after dusk, in consequence of the number of tigers in the neighbourhood.

Our next day's destination lay at a ruined temple (said to be six miles, but subsequently proving three) at which place we arrived late in the morning; at first sight, in consequence of the ruin being so shaded, we despaired of obtaining a picture; but after walking round it we chose one corner, having a splendid background of trees, as being the only suitable point of view; as it was, the camera had to be placed within eight yards of the building, while the trees forming the background were some fifty yards away, testing well the depth of focus of the lens.

Our first difficulty was to obtain water, there being none in the neighbourhood, and without which we could do nothing, as the natives (thinking probably that we had come for the purpose of in some way or other desecrating their temple) refused to give us any assistance in obtaining it; however, on mounting to the top of the ruin for the purpose of examining it, we discovered a hole cut into an ornamental block of stone, which contained sufficient of the desired fluid for our purpose. In many cases we have had to use the water from the cocoa-nut, each of which will yield about a pint. After filling our water-bottle we took the view chosen, first on the large, and then on the stereo plate, with an exposure for the former of eight and the latter ten minutes, keeping the plate damp by means of a piece of wetted velvet thrown over the camera, which succeeds admirably well. There being nothing else of interest in the vicinity, we mounted our horses, and the road lying through sawahs (rice-fields) for two miles, with not the least shelter from the burning rays of the noonday sun, made the change from the shady coolness of the grove in which we had been working, anything but pleasant; the best thing in such a case is to gallop along, thereby causing a current of air, which is much preferable to prolonging the journey by slow travelling.

I will here give a detailed account of the apparatus which we take with us on a journey of a month or six weeks:—First, our tent, containing water-bottle, washing tray, &c.; a portable 7×9 folding camera in leather case, containing slides and lens, also a silk handkerchief for wiping off any dew that may form on the lens, on placing the camera in the sun; a deal box 15 inches broad, 18 inches long, and 15 deep, which contains a mounted glass bath, 8×10, filled with nitrate solution; one 7×9 and stereo plate box, each one containing a dozen cleaned glasses; two Burfield and Rouch's collodion pourers, each filled with two ounces collodion, ready iodized; three ten-ounce bottles, containing iron developer, cyanide solution, gold solution: three two-ounce bottles of acetic acid (glacial), pyrogallic acid, and a ten-grain solution of nitrate of silver for second development; besides these, cloths for polishing, focussing velvets, spirit level, lamp and matches, for drying the plates before returning to the plate boxes, and any other little thing necessary, such as a stand of gutta percha for laying the wet pictures on when taken; on the lid of the box is pasted a slip of paper, on which is written a list of everything contained therein, this we make a practice of examining before starting, so as to prevent the possibility of having to return for some such trifle as the lens or collodion, and by this means nothing is forgotten.

The camera, tent, and box, together with the stand, fit into a piece of basket-work, which, with a bamboo passed through it, is easily carried by four coolies.

We also have a box containing a relay of materials which is generally sent on before, this contains a stock of glass, of both sizes, in plate boxes, 1 twenty-ounce bottle of collodion, 1 twenty-ounce bottle of iodizer (forming, when mixed in equal quantities, an alcoholic collodion of the proportion of five parts ether, to seven alcohol), funnels, filtering paper, a stock of clean cloths, and an extra quantity of bath solution, in case of accident, complete the list.

(To be continued.)

REPORT OF THE COUNCIL OF THE PHOTOGRAPHIC SOCIETY.

In submitting to the members of the Photographic Society the Eighth Annual Report, the Council beg to congratulate them on the scientific position now attained by the Society, and on the general recognition accorded to it as representing photography in this country.

On presenting the Report for the past year, the Council trust that the efforts made by them to guard the interests of the Society, to uphold its position, and to promote its welfare, will meet the approval of the Members.

The plan of throwing open the rooms of the Society in order to promote social intercourse among the members, and to afford opportunities for study, although conceived in a spirit which met with general approval, was found unsuccessful when practically tested. It was therefore determined at the last Yearly Meeting, that notice should be given of an intention to vacate at Midsummer the premises occupied by the Society, at an annual cost of more than £300.

Through the courtesy of the authorities of King's College, a place of meeting more suitable, and equally convenient, was rendered available. The Council at once accepted the liberal terms, and trust that, both as regards expediency, and efficiency, the change will meet the approval of the meeting.

The expenditure entailed by retaining the premises in Coventry Street during the first six months of the year was unavoidable; but it may be now fairly assumed that the change of premises will materially reduce the expenditure.

At the last Annual Meeting, there was presented the Report of the Committee appointed to investigate and decide on the relative merits of such collodions as were submitted for examination under the only conditions to which such a committee could fairly accede. To sanction the admission of preparations without information as to the precise process of manufacture was of course unwarrantable; and to test the properties of collodion supplied in insufficient quantities to allow of thorough examination would have been merely wasting the valuable time of the gentlemen who undertook the investigation. The Council can only regret that specimens of the productions of the numerous makers of collodion were withheld, but think it right to mention that every detail in the manufacture of the preparation approved by the Committee has since been fully published, according to the terms of competition. The expenses incurred during the investigation amounted to nearly £50.

The Journal has, during the past year, chronicled in its columns not only the Proceedings of the Society, together with the Transactions of the Photographic Society of Scotland, but has also recorded the details of various new processes, and the latest inventions and improvements in the heliographic art, often accompanied with illustrations, and afforded information upon all current subjects of interest to both scientific and practical photographers. As a mere record of the Proceedings of the Societies, the *Photographic Journal* would have caused a heavy annual loss to the Society, as the expense of publishing their Transactions does entail on most scientific societies. The actual cost of supplying the Journal has amounted to £90 17s. 5d. The total cost of the year's printing and publishing has been made up by advertisements, which attest the almost universal adoption of photography as a lucrative art. There are now several publications devoted exclusively to photography where there was formerly only one; and to this cause the publishers attribute some diminution in the advertisements, which gives rise to the small loss on the Journal above mentioned.

The presentation to the subscribers of plates illustrating the processes of Colonel Sir H. James and Herr Pretsch, entailed an expense of £20. The specimens of the photographic process of Mr. Joubert, issued with the number for June, were presented by that gentleman for distribution, and involved no expense to the Society.

The loss standing to the account of the Exhibition for 1860 will, there is good reason to believe, not attend the admirable collection of Photographic pictures this year. The expenses of the Exhibition of 1860, up to the end of January, were about £60, and the receipts £76, leaving a profit of £16 only; whereas a clear profit (allowing for *similar* expenses) has accrued of £50 during the same period of the present Exhibition, when the long continuance of wet and foggy weather especially interfered with the success of an Exhibition held before the commencement of the season. The year which began so disastrously to photographers, was equally unfavourable throughout: of continuous bright weather, affording both the opportunities and stimulants to work, there was literally none; and to this cause may be probably attributed the dissolution of several Photographic Societies which had local habitations.

It is hoped that some of the members of these societies will, in the season now commenced, join the central society, as the observations of photographers working in the country, and away from towns, where "houses thick, and drains pollute the air," are especially valuable.

During the past year the Governments of this country and on the Continent have on several occasions officially recognised the importance of photography in ordinary scientific research, in advancing education, and in preserving authentic records of the stirring events of the time. The expedition which visited Spain under Government auspices, for the purpose of securing photographs of the eclipse of the sun, most satisfactorily maintained the high repute of English photographers. The results obtained evinced the scientific precision and exceeding skill of the gentlemen who represented this country; and we are proud to say that Mr. De la Rue, Mr. Vignoles, and others are members of this Society.

Photographers accompanied the brilliant campaign in Italy by Imperial command; and the choicest and rarest works of ancient art in the museums of this country and abroad are now, under Government orders, produced and made known to thousands by the aid of photography.

The Society desire to sound a note of preparation to the members of this Society and to English photographers generally. The photographic section will form an important part in the Exhibition of 1862; and the Council beg to suggest that every effort should be made during the forthcoming season to ensure that this country shall be worthily represented. The earliest information as to the arrangements of the Photographic Section will be published in this Journal.

The Council have felt sincere regret at the loss of their colleague, the late Mr. P. W. Fry. From the first commencement of the discovery, by M. Daguerre, of a process by which light was made to impress upon a silver tablet the images it illuminated, Mr. P. W. Fry became an earnest student of photography. He was amongst the small band who commenced their labours ere yet Mr. Fox Talbot's earliest *photogenic* (so called) processes were fully developed, and before the publication of the Calotype process. So earnest was Mr. Fry, that he purposely visited Falmouth to make the acquaintance of Mr. Robert Hunt, who was reported to have become one of the most successful of the earliest English photographers. Under Mr. Fry's auspices a Photographic Club was formed; and Mr. Cundall, who did so much towards rendering the Calotype a manageable process, and Mr. F. Scott Archer, to whom we owe the use of the iodized collodion, were frequently seen at those agreeable gatherings.

Eventually Mr. Roger Fenton, aided by Mr. Vignoles, conceived the idea of a Photographic Society. The suggestion was warmly entertained by Mr. Fry, Mr. Robert Hunt, and a few others. They were naturally desirous of enlisting Mr. Fox Talbot; and several preliminary meetings were held, at which Mr. Talbot was present. The object of these meetings was to endeavour to induce that gentleman to relinquish some of his claims in favour of the Photographic Society. Mr. Talbot, however, claimed so much, and, although professing liberality to the young Society, his conditions were in every way so stringent, that it was resolved (mainly on the representation of Mr. Fry) to reject the offer which Mr. Talbot, no doubt conscientiously, felt was all he could concede.

To the efforts then made by Mr. Fry and his friends must be referred the ultimate removal of the objectionable restrictions, and the freedom of photography from the shackles of the patent law.

Much discussion has arisen respecting the introduction of the use of collodion; and Mr. Fry's name has been mixed up with that discussion as if he were a claimant for the discovery of the collodion process. This Mr. Fry never was. The facts were as follows:—Mr. Hall, of Dartford, who purchased Schönbein's patent for the manufacture of gun-cotton, was the first to exhibit the film formed from the ethereous solution of gun-cotton: the collodion film so formed was used in the hospitals to protect abraded surfaces from the air. The beauty of this film attracted the attention of photographers; and many endeavoured to avail themselves of it. Collodion was spread on glass, on paper, and on other substances, and films of chloride and iodide of silver were precipitated on the collodion surface, and pictures (very poor ones) were obtained. The earliest use which Mr. Archer made of collodion was for the improvement of his paper surface; for, being then engaged as a sculptor, he saw the service photography would render his art; and as such he took up the study, that he might retain resemblances of objects which he had executed, and which would pass away from his hands. At length, at one of the meetings of the Photographic Club, held at Mr. Fry's house, some really beautiful specimens of collodion pictures were exhibited by Mr. Archer, being the production of a friend to whom Mr. Archer had imparted his discovery, and who had worked with much earnestness in carrying out Mr. Archer's original ideas. Some little time elapsed, and many pictures were circulated, before Mr. Archer developed publicly his secret of *uniting a solution of the iodide of potassium with ethereous solution of the gun-cotton.* Mr. Fry especially urged Mr. Archer on in his discovery, and rendered him the means of bringing it fairly before the public. By this happy discovery the collodion was made an active agent in the delicate process; and from this we date the great extension of the art of producing pictures by sunshine.

When Mr. Fox Talbot commenced his action against La Roche, Mr. Fry most zealously assisted the defendant. He left no stone unturned to bring into court a sufficient amount of evidence to show that the collodion process in no one example could be involved by Mr. Fox Talbot's specification; and very great was Mr. Fry's delight at the success which crowned his efforts. It is not necessary to speak of the many experimental modifications which were introduced into our art by Mr. Fry; several of them are recorded in the Society's Journal. To the late Mr. Fry, the Society owes much. He was one of its founders, and, to the period of his death, was one of its warmest supporters.

The Council have to express regret that the accounts for the current year show a considerable deficit, although the general balance proves that the Society has ample means to discharge all claims against it. Certain expenses, unavoidably incurred during the year (which have been referred to in detail), will be very much diminished, or entirely avoided, in future.

In conclusion, the Council have much pleasure in announcing that during the ensuing year there will be presented to each member of the Photographic Society a print selected from the present Exhibition.

Dr. INCOME AND EXPENDITURE OF THE SOCIETY. *Cr.*

Dec. 31, 1860.	£	s.	d.	Dec. 31, 1860.	£	s.	d.
To Entrance Fees and Subscriptions	372	4	0	By General Expenses ...	460	4	11
Interest Account ...	2	17	6	Exhibition Accouut	125	15	2
	375	1	6	Soirée Account ...	30	3	11
	354	0	11	Photographic Journal	90	17	5
Capital Acc. for Balance (Being an excess of Expenditure over Income)				Property Account, 10 cent.	22	1	0
	729	2	5		£729	2	5

Dr. GENERAL BALANCE, Dec. 31, 1860. *Cr.*

Dec. 31, 1860.	£	s.	d.	Dec. 31, 1860.				£	s.	d.
To sundry persons	369	3	3	By sundry persons				272	14	7
For Balances owing to them.				For Balances owing by them.						
To Capital Account ...	819	6	0	For Subscriptions in arrear—say				100	0	0
For Balance.				By Cash Account :— For balance at Bank ...	£81	8	6			
				Petty Cash in hand	1	5	10	82	14	4
				By 3 per Cent. Consols ...	192	14	4			
				For £200 Stock.						
				By Property Account ...	198	9	0			
				For Estimated Value.						
				By Photographic Journal	341	17	0			
				For Value of Stock.				733	0	4
	£1188	9	3					£1188	9	3

We have examined the above Accounts, compared them with the Vouchers, and find them to be correct.

January 31, 1861.

VERNON HEATH, F. JOUBERT, } Auditors.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 12th February, 1861.

The art-treasures of Mount Athos, to which I referred in a recent letter as having occupied Count Sevastianoff several years in photographing, and which are comprised in some three thousand negatives, are likely to be given to the world by the aid of one of the photo-lithographic processes. M. Lemercier, so well-known for his excellent lithographic establishment, has already attained very remarkable and excellent results, and their publication is looked forward to with the greatest curiosity and interest. Some proofs from a New Testament of the ninth century, printed on parchment paper, are issued as specimens, and leave nothing to desire. They fully equal the specimen of Colonel James's photozincographic process, given in the Photographic News some months ago.

It may be well to remind British photographers that the Paris Photographic Society's Exhibition will open at the *Palais de l'Industrie,* on the 1st of May next, at the same time as the Exhibition of Paintings. Exhibitors must forward their pictures so as to arrive here between the 5th and the 15th of April, addressed to the agent of the society, M. Laulerie, Rue Drouet, No. 11, or Palais de l'Industrie, (Champs Elysées) porte No. 1, *carriage paid.* As the pictures, when framed and glazed, are exposed to much risk of breakage in the transit, the society undertakes to have those which are sent simply mounted, framed and glazed in Paris, at moderate charges, but they must be forwarded as early iu the month of April as possible, as if delayed while in the framer's hands, and are not delivered at the Exhibition on or before the 15th of April, they will be rigorously excluded. Coloured photographs will not be admitted, nor those which are 'touched' to such a degree as to destroy their integrity as photographs. The works sent for exhibition will be submitted to the examination of a committee, who will decide upou their admission or rejection. The class of subjects which will find most favour as contributions from England, is, undoubtedly, landscapes, subjects possessing stroug local or pictorial interest. Neither portraits nor composition-subjects are likely to find much favour here, unless the former possess high individual interest.

Mr. Gaughain, in experimenting with immersed telegraph cables, finds that gutta-percha employed as a protecting envelope for the wire, so far from being a non-conductor, is, in fact, a conductor. He states that if the couducting wire were perfectly isolated, the cable would form a veritable Leyden jar so soon as it becomes immersed. By substituting shellac for gutta-percha in his experiments, he was enabled to obtain perfect insulation of the conducting wire. It was found that to charge a condenser through wire insulated by shellac, no appreciable lapse of time took place, while if charged through a wire coated with gutta-percha, fifteen miuutes elapsed before the condenser was fully charged; moreover, in the latter, the same length of time was required for the complete discharge; this, it is evident, must be attended with many serious consequences.

A remarkable improvement in street lamps results from the employment of M. Degrand's skeleton lenses. They are distinguished from all similar productions whether moulded or cut, by their extreme thinness. The reduction of their prominences is such, that they are, properly speaking, nothing but simple glass striæ, capable of being employed for glazing window-sashes, lamps, &c. It is a most extraordinary fact, that within the thickness of window-glass we can have lenses of all dimensions and of any focal distance, exactly the same as with the thick lenses of Fresnel. To obtain this result, it is only necessary to prepare a metal matrix or mould, presenting in its hollows, curvatures calculated to any required formulæ, and employ it to *strike* lenses as we do coins or medals, substituting for the metal thin pieces of glass softeued in the furnace. In the moulding, or striking of the lenses, M. Degrand employs with much success a bronze polish. The principal aim of this skilful engineer in the construction of his plane lenses has been the improvement of street-lighting, the diminution of the considerable loss of light in the atmosphere, or, in one word, to increase the effective light of lamps. Experiments conducted with the greatest care have proved that the interposition of a striated lens augmented the light of an ordinary lamp from 1 to 5·49. This result exhibits, most strikingly, the imperfections of the present system of lighting, and the advantages to be derived from adopting the new lenses. The expense of adopting them is very moderate. Applied to lighthouses, these lenses give results no less satisfactory; they absorb less light, spread it more uniformly, and reduce the cost of lighting fully one-half.

THE RECENT MEETING OF THE PHOTOGRAPHIC SOCIETY.

Sir,—I see in the report of the discussion at the meeting of the Photographic Society ,in the last number of the News, that "Mr. Malone, as a party to all the arrangements at the time, must repeat that Mr. Talbot never wished to throw obstacles in the way of amateurs using his process; he only made it a condition that they should not practise it for profit," &c.

My first experiments in photography were about 1842, with bichromate of potash, and when I thought of proceeding to the calotype process, I asked Mr. Robert Hunt, at that time one of the principal authorities on matters photographic, if I might do so, solely as an amateur. His reply was, that Mr. Talbot threatened with an injunction any person who used it, even for amusement, without a license from him. Accordingly I wrote to Mr. Talbot, stating distiuctly my wish to practise it as an amateur, aud without any view to profit, and received an immediate reply from his solicitors, enclosiug a copy of agreement which I should have to sign. In the first place there was a payment of £20 for the license, which, to the best of my recollection, might be withdrawn at any moment, and I was forbidden even to give away any prints to friends without Mr. Talbot's leave first obtained. To sell them was of course not to be dreamt of. There were other restrictions which I cannot at this distance of time recollect—but perhaps one of your readers may have a copy of the agreement. If so, it would not be without interest, and might help to refresh Mr. Malone's recollection.

Does Mr. M. mean to say that the fear of an injunction, or the payment of £20, was no obstacle in the way of amateurs? Happy man! to whom £20 is no object, and the threat of an injunction in Chancery has no terrors. In those days photographers had other than chemical and optical difficulties to encounter.

I don't mind acknowledging now, that after refusing to have a license, I straightway went and got a camera, and proceeded in my experiments, hoping that, as I was scarcely safe for the costs, Mr. Talbot would begin with some of those more distinguished amateurs, whom I had ascertained were practising his process under similar circumstances.

W. Russell Sedgfield.

Proceedings of Societies.

Photographic Society of Scotland.

The fourth meeting of the present session was held in the Society's Hall, George-street, on Tuesday evening. Sir David Brewster, K.H., F.R.S., President of the Society, in the chair.

Mr. Robert Armstrong, Photographer, 63, Princes-street, was elected an ordinary member of the society.

An interesting paper on "Photographic Portraiture," was read by Sir David Brewster, in which he pointed out the various defects inherent in portraits produced by the large lenses at present in use, and suggested the substitution of small sized lenses of rock crystal, as a means of obviating such defects to a large extent. With the view of giving an ocular illustration of the state of photographic portraiture, Sir David proposes to exhibit at the next meeting of the society a series of portraits of the same person, as taken by several of the most eminent photographers; as other members have promised their co-operation, several series of such portraits will probably be exhibited, and afford many curious illustrations of Sir David Brewster's views.

Mr. Horatio Ross announced the result of the competition for the Silver Medals offered as prizes for pictures in the Exhibition of the Society now open. Having been requested by the committee to officiate as judge, he said that he had devoted a great deal of time to the examination of the pictures, but had experienced the greatest difficulty in making up his mind, particularly as to the best landscape. He found a number of pictures by Maxwell Lyte; Annan, of Glasgow; Mudd, of Manchester; Fenton, Dixon Piper, and Vernon Heath—all as nearly balanced, in point of merit, as possible; and it was only after advising with various members, on whose good taste he could rely, and finding no preponderance of feeling in favour of any particular picture, that he felt himself warranted in awarding the prize to the picture which he himself preferred —"A View of Pierrefitte," by Mr. Maxwell Lyte, No. 106 of the catalogue of the Exhibition. In regard to the other medal he had not found so much difficulty; for although there were several admirable portraits exhibited by Mr. Tunnoy, Mr. Moffatt, Mr. Orange, and other photographers, he was of opinion—and in this view the friends with whom he had consulted concurred—that M. Claudet's portraits were the best, and he was chiefly at a loss to determine the particular picture for which the prize should be awarded; ultimately, he had fixed on the picture, No. 67 of the catalogue, "A Lady in a bridal dress." Mr. Ross, with the approbation of the Council, suggested that the society's bronze medal should be given to Mr. H. P. Robinson, for his excellent composition picture of a "Holiday in the Woods." This was cordially agreed to, and the thanks of the meeting voted to Mr. Ross for the great amount of trouble he hae taken in the matter.

The Honorary Secretary read a communication from M. A. Claudet, F.R.S., "On the Laws which Regulate the Conjugate Foci, and the Sizes and Proportions of Images, according to the Distance of Objects." In this paper, for which M. Claudet was complimented by the President, he pointed out the advantages which photographers would derive from being able to determine beforehand the exact position of the focus with reference to the object, and the resulting degree of reduction or amplification of image—he defined the positions before and behind the lens from which all distances must be measured for obtaining an exact proportion of perspective; detailed the means by which these positions could be practically and surely determined, and a scale established for every lens, which would show in all cases the focal distances corresponding to the distances of objects, and he gave various tables for applying the results so obtained.

The business of the evening concluded by the Honorary Secretary reading a paper by Mr. C. J. Burnett, in which he suggested several improvements in photographic etching; the use of aluminium for photographic apparatus, and methods for obviating the necessity of mounting photographs by printing them, so that the margin forms a part of the paper on which the picture itself is printed, and which he recommended as particularly convenient for photographic illustrations for books.

Photographic Notes and Queries.

India-Rubber for Baths, &c.

2, *Queen-sq.*, *Westminster, S.W.*, *6th February*, 1861.

Dear Sir,—I will now give you the promised particulars of the manufacture of baths of pure india-rubber.

Take a block of wood, the size of the bath to be made, and having procured from some respectable india-rubber warehouse (I prefer Messrs. Macintosh and Co. for the *purest* rubber) a piece of "stationer's cut sheet," about No. 13, the *exact* thickness will depend upon the size of the bath, cut sides and ends a quarter of an inch larger than those of the block, and lay them in their respective places on it. Now cut off the projecting pieces all along with a sharp pair of scissors, and it will be found that the scissors in cutting the double rubber at the corners have made a *joint* there, which will be sufficiently strong to enable the operator to complete the bath conveniently.

The india-rubber for the bottom should be *half* an inch larger than the bottom of the block, and pieces one quarter of an inch square should be cut out of each corner, so as to leave a space in the middle the exact size of the block, pieces a quarter of an inch wide will then be left to lap over the rubber, forming the sides and ends of the baths; now comes the operation of cementing, first procure some benzine (not ben*zole**), which can be had of any respectable chemist, and with a clean rag apply it to the quarter-inch flaps, and to the depth of a quarter of an inch round the sides and ends of the rubber on the block, which will then be found to be "tacky," now put the block upright in the middle of the bottom piece, and turn up the flaps against the sides and ends of the bath, and with gently rubbing the finger along it will form a perfectly water-tight and in other respects a very strong joint; the only things that remain to complete the bath are, cementing in the above manner four strips of rubber about half an inch wide over the temporary joints made by the scissors, and also cementing two tubes (one on each side of the bath at the *top*) through which wires are to be pushed; these wires must be about one inch longer than the width of the bath, so that they can be stuck into any woodwork about the operating chamber, and thus support it in a vertical position.

The above description is for a *travelling* bath, and, as I said before, can be rolled up and put into the waistcoat pocket; but for a bath for stationary purposes I should recommend rubber thick enough to support itself, jointed with thin rubber, or made as I have made mine, namely, a *wooden* case lined with very thin rubber, the advantage of which is that it can be turned inside out and throughly cleansed.

* Some confusion appears to exist in our correspondent's mind here. The terms *benzine* and *benzole* are applied indiscriminately, and both indicate the same article. Probably our correspondent may have been supplied with a more highly rectified sample of the solvent referred to, by a dealer who has applied the former term, and hence he conceives an absolute distinction to exist.—Ed.

I will make no further comment upon the qualities of an india-rubber bath, it will speak for itself.—I am, sir, yours obediently,
LEO. DAFT.

A SINGULAR FACT.

MR. EDITOR,—Believing that it is always advantageous to our delightful art to communicate our experiences, and more especially when they appear to be unusual, I am induced to trouble you with one of mine which I consider so, it never having occurred to me before, or come under my notice in any other way.

About a week ago, having to take a photograph of a small machine, I coated a quarter plate with Hardwich's collodion, and exhibited it as usual; but the glass being a very small one, one of the corners passed through the plate-holder, and to get it back I raised the slide, thus allowing the light to pass through the plate, when, to my surprise, I saw the front of a figure in a different (more transparent) shade impressed on the film, which a friend, whose attention I called to it, immediately recognised as part of the figure of a lady of which I had made some positive copies, one of which had doubtless been washed from this glass, though it showed no stain or blemish while cleaning.

To preserve it I exposed the plate for an instant to white light, developed with pyrogallic, and fixed, which has left the figure as if it had been exposed in the camera in those parts where it showed itself before exposure.

If you wish to see the plate I shall have great pleasure in showing it to you.—I am, yours obediently,
F. LANE.

103, *Southwark Bridge Road, 2nd Feb.* 1861.

[The phenomenon is curious. We have heard before of similar cases, but not often. We should be glad to see the plate.—ED.]

MAGNETISM AND PHOTOGRAPHY.

THE following extract, from an instructive article in the *London Review*, will interest our readers as bearing on the importance of magnetic registrations, and the beautiful application of photography to that purpose:—

We have discovered that electrical undulations are established upon the surface of the earth by the action of the solar rays, and that they circulate from east to west, varying in their intensity with the varying position of the sun relatively to the place of observation. That fine old Swedish philosopher, Oersted, proved the connexion of magnetism and ordinary current electricity, and demonstrated that all magnetic phenomena take place at right angles to such electrical paths. Thus we know now, that the magnet (the compass needle) points to the north and south, because the electrical circulation is from the east to the west, magnetism and electricity being always at right angles to each other. There is a continual variation in the *force* or *intensity* of the earth's magnetism; these variations—hourly, daily, monthly, and yearly—observing a certain degree of regularity, and exhibiting a peculiar dependence upon the relative positions of the earth and the sun.

Since every variation in the magnetic force of the earth produces some disturbance in the magnetic needle, it was important to determine with exactness the laws by which these laws were regulated. As the commerce of the world is materially concerned in the perfect appreciation of all that affects the mariner's compass, the great nations of Europe and America combined to establish magnetic observations in all parts of the globe.

The method of making a magnetic observation is to examine the number of oscillations made by a magnetic bar in a given time. It will be understood, upon reflection, that if a *magnetic bar*, freely moving, being attracted by the *magnetic earth*, is influenced by powerful force, it will move with more difficulty than when this action is weak. Thus the observer noted the number of oscillations made in each minute of time, during each set of observations, and these being carefully recorded, showed the amount of variation in the earth's magnetic force.

On one occasion when such observations were being made, the magnetic bar was seen to become suddenly agitated, to move more rapidly, and describe a larger arc. This could not be explained, but the fact was recorded. Eventually, returns were made from the other observatories, and a similar phenomena to that which took place at Greenwich was found to have occurred at Toronto, St. Helena, Kerguelin's Land, and other places, at the same instant of time. Humboldt gave to this kind of disturbance the name of a *magnetic storm*; and these storms were found to have a close connection with aurora. By the refinements of modern science, photography has been made to take the place of the observer, and by ingenious arrangements a ray of light is reflected from the end of the magnetic bar, and made to record, by the chemical change produced on photographic paper, every movement by day and by night, to which the bar may be subjected. By these means we have learnt that those magnetic storms are of frequent occurrence, and that they are simultaneous over hundreds and thousands of miles.

Some mighty and mysterious power influences the earth's electricity, and this is made known to man by the tremor of a magnetised bar. The intelligent observer solicits nature to reveal the secret of this, and after long and patient prayerful working, an answer is given. That answer telling us that the phenomena of magnetism, as manifested on this planet, is the continuation of a development of physical force, dependent upon changes in the form of matter which occur in the sun.

The sun's brightness depends upon a gaseous self-luminous envelope, to which Arago gave the name of the *photosphere*. This envelope is subject to peculiar disturbances, which are indicated to us by the formation of dark spots. These spots have been the subjects of observation since 1612, when Galileo made some important observations on them. Sir William Herschel, 1801, published a remarkable paper on the spots, and endeavoured to show that there was some connection between the number of spots seen in any given year on the sun's disc, *with the price of corn in the English markets*. But Hofrath Schwabe of Dessau has given us the most reliable information respecting these spots. During the long space of thirty years he has often examined the sun's disc for upwards of 300 days in each year. The tables which Schwabe has published leave no room to doubt that the solar spots occur in cycles of about ten years; the smallest number seen in any one year being 83, the largest number being 333. Five years are expended in advancing from the minimum to the maximum number, and five years again in descending to the minimum.

Schwabe writes:—"I do not believe that the spots on the the sun have any influence on the temperature of the year;" but he could examine only the results of a limited area. The enlarged observations of Dove, who was supplied with returns from every part of the world, go to show that there is a a connection between the variations of the mean annual temperature of the whole earth, and the production of solar spots. We have not, however, now to deal with heat, but magnetism. All the observations made at the magnetic observatories of the world, are returned to General Sabine, and carefully reduced by a staff of engineers, under his direction, at Woolwich. The result of the most careful examination has been, the announcement of the astounding fact, that the periodical inequality of the earth's magnetic force has its opposite phases of maximum and minimum, separated by an interval of five years, of which the cycle may be conceived to include about ten of our solar years.

The regularity with which the alterations of increase and decrease have been traced by Schwabe, in his observations of the solar spots, is found to occur in the earth's magnetism. "The coincidence," says General Sabine, "as far as we are as yet able to discover, is absolute; the duration of the period is the same, and the epochs of maximum and minimum fall in both cases in the same years."

We know not of any series of observations, within the history of modern science, which marks more completely the triumph of the human mind over nature than this. There certainly has never been developed to man a more exalting fact, or one which shows more completely the delicate balance maintained between cosmical phenomena. A disturbance takes place in the sun—which, in many respects, resembles our great revolving storms of the tropics—and this disturbance is communicated through millions of miles of space, and shakes the magnetism of the abode of man.

A SIMPLE MICROSCOPE may be made out of a common pill-box for a few pence. Take out the bottom and put in a piece of window glass; then paint the inside black, and make a small eye-hole in the lid. In this hole place a single drop of warm Canadian balsam, and allow it to cool. This drop of the transparent resin assumes, when cooling, the proper form of a glass lens, with considerable magnifying power.

Talk in the Studio.

Her Majesty at the Exhibition.—Her Majesty the Queen, and His Royal Highness the Prince Consort, accompanied by the Princesses Alice, Helena, and Louise, visited the Photographic Exhibition in Pall-Mall East, yesterday morning. In attendance were the Viscountess Jocelyn, the Hon. Caroline Cavendish, Lord Alfred Paget, and Lieutenant-Colonel the Hon. D. de Ros. Her Majesty, with her accustomed punctuality, arrived in Pall-Mall at just two minutes past ten in the morning, and remained nearly two hours engaged in examining the various productions, with which she expressed herself highly gratified.

The Architectural Photographic Exhibition.—An interesting lecture on the Photographs of French Gothic Architecture of the Thirteenth Century, was given by R. P. Pullan, Esq., on the evening of Tuesday last. The lecturer emphatically claimed for photography the position of a fine art, and for the cultivated photographer the position of an artist.

New Photographic Society.—A contemporary states that a new society is about to be formed in Edinburgh. A preliminary meeting has been held to consider the matter, and from the general opinions expressed, it appears probable that the meetings will be held fortnightly, and partake largely of a conversational character. A meeting for the election of officers &c., is to be held on the 20th instant at Buchanan's Temperance Hotel.

Crystal Medium.—A new application has just been made of the prepared sheets of mica, or crystal medium, sold by Messrs. Squire and Co.; it consists in using it instead of glass to cover the cartes des visite portraits. Being perfectly flexible it can be applied to these portraits, which are put up in flexible pocket cases, without the danger of breakage which would of course attend the use of glass. The application is useful and ingenious, and gives a pretty effect.

Domesday Book.—It was announced, at a recent soirée at Southampton, that the original "Post-Office Directory" for 1080, had been disinterred from the Record Office, and will, under the superintendence of Col. Sir H. James, be photographed *in extenso*, so that all good subjects of Her Majesty will acquire the important information of how many acres of land, horses, carts, beeves, and swine were possessed by the vassals of William the Conqueror. The process used will be Col. James' method of photo-lithography.

Photographs of Lord John Russell.—His Lordship sat for several negatives at his residence, Chesham Place, to the artist of the London Stereoscopic Company on Tuesday last. Some very fine portraits were, we understand, obtained.

The First Portrait.—The Prussian correspondent of one of our daily contemporaries writes:—Princes cannot but allow themselves to become famous, even in their days of nonage. I have to acknowledge the important fact that of the hundred pictures destined to perpetuate the features of baby Prince William, the very first has just made its appearance in the world of art. The portrait is a photograph depicting the son of our Princess, in the grave and solemn act of sleeping a royal sleep, and perhaps dreaming royal dreams. In the bookseller's windows in Berlin you may see the quaint little fellow in his cradle by the side of a still more serious picture, representing his late Majesty.

New Solar Camera.—*The Scientific American*—which we may mention in passing as one of the best papers of the kind in the world—describes another solar camera recently invented, in which instead of the mirror travelling with the sun so as to secure the same angle of reflection, the same effect is obtained by a series of mirrors:—The object of this invention is to obtain from photographic negatives of a given size, positive pictures of a much larger size. The invention relates to the employment of mirrors to reflect the direct rays of the sun through the camera containing the negative, and it consists in so applying and operating a system of mirrors or reflectors in combination with the camera, whereby, notwithstanding the movement of the earth upon its axis, the rays of light will continue to be reflected in the same direction for as long a time as may be necessary to obtain the print, and distortion of the picture be prevented. The credit of this invention is due to J. H. Whitley, of Oswego, N.Y.

To Correspondents.

A. H. Scott.—M. Lejune's plate-holder, described in the News for May 28th, is there stated to be manufactured by Messrs. Gaudin. Beyond this we have no information on the subject.

Ricardo.—The statement of "S.S.B." on the number of pieces of wire-gauze necessary to prevent regurgitation of the flame in the oxyhydrogen apparatus, may be relied upon, as coming from one thoroughly experienced in the matter. We have not tested practically the various suggestions of our correspondents as to the magic lantern. We can only refer Ricardo to what has appeared in our pages, and leave him to select the plan best suited to his appliances.

S.B.—In taking stereoscopic pictures with a camera, on Latimer Clark's principle, it is necessary to adjust the position of the lathes by means of the screw to suit the distance of the object to be taken. Observe that the image occupies the same position on the ground-glass which-ever position the camera may be in. The two pictures should not be much more than about two inches and a half from centre to centre; if they are at a much greater distance, the eyes of most persons will have difficulty in making the images superpose so as to produce the proper stereoscopic effect. A few experiments with the adjusting-screw, and observing the effect on the ground-glass, will enable you to produce the proper result. 2. White, or blue calico, answers well for the blinds of a glass-room.

A Junior Photographer.—The *Photographic Quarterly Review* is discontinued, and there is no other quarterly journal of photography. There is no monthly photographic periodical except the *Journal of the Photographic Society*; the price of which by post is sixpence.

X.—The patent pressed lenses are to be procured, we understand, from Messrs. Chance, Brothers, of Birmingham. They are somewhat expensive, a lense of 12 inches diameter costing about £15. We apprehend that a much less costly condenser might be used for the purpose indicated.

Lex.—You may photograph copyright engravings for your own private amusement; but if you sell a single copy you are liable to an action.

B. B.—Under-exposure and dirty plates are the palpable causes of your failure.

James.—The time necessary for a plate to remain in the bath varies very much with the temperature. It may generally be safely removed as soon as the solution flows evenly over the surface, instead of running in greasy streaks. If left too long in the bath, the plate has a tendency to fog.

M. M. E.—The unfavourable weather which has prevailed for so many months has proved an almost insuperable barrier to experiments with the solar camera.

E. J.—Use fresh starch for mounting. The tendency of albumenized prints to curl up before they are mounted is sometimes very troublesome. To overcome the difficulty take a parcel of the prints and roll them up for a few minutes in an opposite direction.

Positive.—Excess of nitric acid in your developer will cause the picture to be covered with metallic spangles. A small portion of nitric acid will give a more metallic tone to your pictures; but beware of having too much.

W. Cox.—Doubtless any optician could supply you; but we will make some definite enquiries as to price &c., and let you know in our next.

W. W. M.—See article in the present number on the application of the Lime Light to the Solar Camera. If that does not meet your case, let us know, and we will enter into the subject.

D. A.—We should as readily purchase either No. 1 or 2 as any of the others. In selecting a large lens it is important to have a good one. If you send us your address we can give you more particulars by letter.

W. H. L.—We have no doubt but that Ponting's Collodion will work very well for a dry process, if you add from half a grain to a grain to the ounce of bromide (of ammonium in preference to cadmium as the collodion already contains cadmium in the iodide). 2. Your failure probably arises from using a simply iodized collodion. It is important to have a second salt of silver in the film in the dry processes in which all, or nearly all, the free nitrate is removed. 3. The brown deposit is probably gold. We prefer to make the toning solution fresh, using just sufficient for the prints, and not using it twice.

No. 35.—There is a new edition of Dr. Hassall on adulterations, published this year: the price is 17s.6d. There are various good works on the microscope besides those you possess; amongst which we may name Queckett, price 21s. The Micrographic Dictionary price 45s. West's half hours with the Microscope, price 2s.6d. &c. We cannot just at this moment say which will contain all the information you require.

1. 2. 3.—The stains on your negative appear to proceed from the bath, which is not in good order. A bath saturated with acetate of silver is difficult to manage, especially when it becomes old and contains an accumulation of ether and alcohol. Try the addition of a minute dose of nitric acid. Try also another sample of collodion. The deposit on the surface of positives which brushes off, arises from over reduction. Add a little more acetic acid to your developer.

F. R.—Lime balls are sold in bottles containing a dozen for 2s. 6d. You may make them cheaper by procuring lime by the bushel, and picking out the suitable pieces, and sawing them to a proper length. They are then rasped roughly into shape, and finally fitted into a mould of wood to finish them to the exact size and shape.

J. H. Jones.—We are obliged by your communication, and will write to you shortly.

T. Waawick.—We do not know what kind of dirty stains you mean. A dilute solution of oxalic acid will answer the purpose in some cases. Rubbing with a piece of cuttle-fish bone will answer in other cases. The best means of rendering a rough surface smooth is by means of rolling or hot-pressing.

W. A. Y.—Use the calotype process. The exposure of excited paper in an ordinary enlarging camera is somewhat long. Prepare the paper by first floating on a solution of—bromide of potassium, 12 grains; iodide of potassium, 8 grains; and then excite on a 60-grain silver bath. Expose whilst moist, and develope with a solution of gallic acid. Use Hollingsworth paper. 2. Your collodion will never be so good as it originally was. The best plan now is to mix it off with new collodion, whereby both may be improved.

H. T. T. and others in our next.

N. M. Mathews we will communicate by post.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 129.—February 22, 1861.

PRINTING BY THE ELECTRIC LIGHT.

Since the opening of the present Exhibition, and too late for either regular hanging or insertion in the first edition of the catalogue, Mr. Bedford has contributed a frame of three photographs, which to us possess an interest equal to, if not surpassing anything in the room. These three specimens, No. 623, are printed by the electric light, Professor Way's valuable modification having been used. The first impression on glancing at the frame is that it simply contains some of Mr. Bedford's prints, the only peculiarity of which is their excellence. The fact of there being copies of the same prints already on the walls induces an examination to ascertain why this duplicate frame stands in front of the Curator's table, and then it is found that the modest information is subjoined, that they are printed as we have stated, and that they are the result of a first trial. The latter part of the information need not be understood in any apologetic sense, for the pictures need no such plea: they are as brilliant, vigorous, rich, and perfect as need be desired; and so far as the gas-light comparison we made may decide, equal in all respects to the same pictures produced by sun-printing.

Our readers are aware that printing by electric light has before been accomplished. The interesting paper read a few months ago by Mr. Malone, and published in our columns together with the results he showed, demonstrated the possibility of the process; but we have not before seen absolutely perfect pictorial results produced by such agency, and under conditions which attest that this experiment need not remain an isolated one, illustrating a curious and inapplicable possibility; but affords good assurance that the process may be brought quite within the commercial exigencies of the first-class photographer.

Mr. Bedford has favoured us with a few details of the conditions under which these pictures were produced, which are to us in the highest degree interesting, and cannot fail to be so to photographers generally.

Our readers are already aware of the peculiarities of Professor Way's lamp, which have been described in previous articles.* One of its advantages over the Duboscq and other electric lamps being that the perpetual flow of the fine stream of mercury gives a light perfectly continuous, whilst where the carbon points are used the light is intermittent. The chief peculiarity and advantage to photographers arise out of the nature of the light, which possesses great volume, instead of appearing as a single vivid point; and, of still more importance, that it possesses, in a much greater degree than the electric light produced by other means, an intensely actinic character, which gives it a peculiar value for printing purposes.

The pictures now exhibited, Mr. Bedford informs us, are not only the result of a first trial, but that trial was made under circumstances somewhat unfavourable for success, the lamp being an imperfect one, and all the arrangements of an improvised and temporary character. The printing-frames were suspended about twenty inches from the source of light, and the exposure required was a little upwards of an hour, the negatives being somewhat dense and the paper prepared as for ordinary printing. One especial point that strikes us is a remark made by Mr. Bedford, to the effect that the light possesses a peculiarly penetrating power, readily finding its way through the densest portions of dense negatives, thereby giving more detail in the lights than can be obtained by diffused daylight. Here, then, is a valuable source of power to the artistic printer, by which every class of negative may receive exactly the treatment it requires. If it be dense, and require a penetrating light to bring drawing into what would otherwise be snowy patches of light, it can be brought near to the source of light, the most penetrating power of which it may then receive. If the negative be soft or weak, by removing the printing-frame some distance from the source of light, all the effect of diffused daylight may be obtained; and this may be graduated to suit any character of negative. Here is a power of the utmost value to the printer quite under his control.

Regarding the cost of the light, Mr. Bedford informs us that in this intance the expense was about two shillings per hour, and adds, that "as it would be an easy matter to arrange a goodly number of frames around the light, it might be worked economically." Various details as to the best method of working, at the least cost, and questions regarding the best method of preparing the paper, &c., must necessarily be elucidated by further experiments; but we think that this "first trial" of Mr. Bedford's establishes the fact that the thing can be done, and that it may, at least, under many such circumstances as Mr. Malone on a former occasion adverted to, be done so as to be commercially remunerative. Mr. Bedford emphatically remarks, "I am convinced that the light is suitable for our purpose; it only wants utilizing."

M. Lacan, in an interesting letter to a contemporary on the same subject, describes some experiments made by a well-known Parisian photographer. In this instance Professor Way's improved lamp was not adopted; but one in which the old principle of carbon points is used, with an arrangement to keep them in contact. M. Lacan's description is interesting, but scarcely affords much encouragement as to the use of the light for portraiture. He says:—

I was present on Thursday last at a series of very curious experiments made by Nadar, in his new operating room, for the purpose of applying the electric light to photography. I found there a numerous party of men of letters, artists, and even practical photographers, all desirous of learning the results to be obtained from the alliance of the two great modern discoveries. The first essays were for obtaining negative portraits. The model—I had almost said victim, the operation was so long and tiring—sat at about two metres and a half* from the focus of light, and was placed so as to be lighted from above and a little to the right, while white screens around, and a large mirror on the shady side, sent back upon him the diffused rays. The light is very intense; the moments of intermittence are rare, and arise solely from the impurities of which they have not been able to entirely rid the charcoal. Three portraits were taken, the *pose* for the first lasting one minute and a half, for the second eighty seconds, and for the third forty-five, which appears sufficient. The collodion employed is not peculiar. The developing is done, as usual, with pyrogallic acid.

Experiments were next made in producing transparencies on glass by means of camera-printing and wet collodion:—

The printing apparatus had been composed as well as could be managed for the occasion, by placing opposite to each other a fixed camera and a telescope one, the space unavoidably left between them being covered with pieces of stuff. This extemporised apparatus was placed so that the negative was at about fifty centimetres† from the lamp. At the other extremity were

* See articles "Scientific Gossip," pp. 230 and 268 in our last valume, as well as some other articles.

* A little more than eight feet.

† Not quite twenty inches.

successively introduced several sensitised glasses, whose time of exposure was varied. Four seconds, with pyrogallic acid development, gave very satisfactory pictures. With a fine *cliché*, in which the contrasts between the lights and shades are not too violent, the exposure may be reduced to three seconds.

For the preparation of the glasses a collodion somewhat rich in pyroxyline is made use of. The image is developed by means of a weak solution of pyrogallic acid, avoiding as much as possible the addition of nitrate of silver. The exposure ought to be tolerably long for the image to appear in all its details. In the solar light, according to the author himself, the time of exposure varies much, but is never less than twenty seconds, which would give a great advantage to the electric light. The image is fixed with hyposulphite of soda, or, still better, with cyanide of potassium. After the fixage the picture is very beautiful by transparence, and, if it is desired that it should remain in that state, washing and drying are all that is necessary. Viewed, on the other hand, by reflection, it is of a disagreeable grey tone. This inconvenience may be obviated easily in the following manner:— A solution of bichloride of mercury is poured upon the glass. The image first becomes black, then white: when it has acquired a very uniform tint, a weak solution of ammonia or of hypo is poured upon it. The tone then becomes very vigorous, but pales a little in drying. There must then be applied upon the collodion a layer of white, which is to form the ground of the picture. For this, the white is diluted in a mixture of copal varnish and benzole; then spread over the glass, just as a layer of collodion. Being very even, it dries rapidly. The picture may be kept in this state, and produces a good effect; but it is preferable to transfer to paper, which is easily done by fixing a sheet of white paper upon the colour, and then letting it dry: the whole may then be taken off without difficulty. The image has a good deal of brilliancy, and looks as if it were covered with a layer of gelatine, if a well-polished glass has been operated on. We saw this transfer made very rapidly at Nadar's, notwithstansing the unfavourable conditions.

The lamp used is described as one of M. Servin's, which is very portable and convenient, and was connected with a battery of fifty elements.

From the description here given, and many other considerations, we think it is clear that the electric light is scarcely likely to become applicable for the purposes of portraiture. Its practical advantages lie in another direction. M. Lacan sums up the matter in the following conclusions:—

The light with which Nadar operated the other evening costs him fifty francs each time, whereas the light of the sun, in all its abundance and fecundity, is offered gratuitously to all who will turn it to account. Further, the results obtained in this manner, as far as negatives are concerned, can never be equal to those produced by the solar light. Still, there are many cases in which the electric light would be a valuable resource: for instance, when dark interiors or tombs in cathedral vaults have to be reproduced, or when one is called on to take portraits after death, in rooms into which but a feeble daylight penetrates. Its most important use would be for the printing of positives, especially if a means of sensitising gelatine were discovered, so as to permit of the employment of one of the carbon processes. There would be economy of time, as the night would become available; and, at the same time, the certainty of strength in the pictures. Lastly, this means would be applicable to magnifying apparatus, the principal inconvenience of which is the impossibility of using it without the direct light of the sun. With the electric lamp we should be independent of the collaboration of the capricious luminary, and should be able to operate at any hour and in any weather.

THE HYDROMETER BATH TESTER.

The uses of photographic societies and of photographic journalism sometimes receive curious illustration. Whatever may be regarded as new in principle, or useful in practice by one photographer, by the combined means of societies and journals soon becomes the common property of all photographers. But if the supposed New be Old, or the asserted Useful be doubtful or deceptive in practice, it is by the same agencies at once denounced and exposed, to the advantage of the photographic fraternity at large, and the confusion of its unlucky advocate. This system has undoubtedly its benefits, and furnishes, in the main, the surest guarantee for the sound and true progress of the art. It has, however, its partial evils, which are illustrated when reliable guides, and valuable practical conclusions, are thrown into temporary discredit, by the publication of statements based on assumed data and inconclusive experiments.

A discussion on silver meters, which has just arisen, is a case in point. At a recent meeting of the North London Society, Mr. Hughes read a valuable paper on the subject. based upon a series of experiments, the execution of which we had the pleasure of witnessing and verifying, and to the careful and intelligent performance of which we could bear ample testimony, did not the high authority of Mr. Hughes' name, and his well-known practical ability, render it unnecessary. The result of these experiments is a recommendation to photographers to use occasionally, for exact verification, a test based on chemical analysis; and for daily printing purposes, as a sufficiently reliable approximate guide, a test based on the known specific gravity of a given amount of nitrate of silver in solution. Mr. Cramb, a gentleman regarded, we believe, as a clever photographer in his district, is dissatified with these conclusions, styling them, with more force than elegance, "complete befooling," and having set himself right at the outset by a confessed foregone conclusion, enters into a series of experiments, the results of which he lays before the Glasgow Society.

We have no intention of entering into any lengthened examination of the results of Mr. Cramb's experiments, nor of the question at large. That we may leave safely in the hands of Mr. Hughes, who is, we believe, engaged in a series of exhaustive experiments, to give to his conclusions as thorough a scientific completeness, as they have already a practical value; but we wish just briefly to suggest one or two of the sources of error into which Mr. Cramb has fallen, in order that our readers, who may have noticed the discrepancy, may not be placed in any uncertainty in their use of the hydrometeter as an approximate guide.

The assumption upon which the alleged inaccuracy and uselessness of the hydrometer as a test for the printing bath is based, arises out of the consideration that nitrate of soda, or some other base, is formed by double decomposition on the contact between the chloride salt in the paper, and the nitrate of silver solution. This nitrate of soda it is assumed is dissolved out of the paper, and enters into the bath, thus introducing an element which will affect the specific gravity, and nullify any test based thereon. This Mr. Cramb calls one of the "known principles in chemical and hydrostatical science."

Now, it is undoubtedly in accordance with a known principle of chemical science, that when chloride of silver is formed by the double decomposition of nitrate of silver and chloride of sodium, nitrate of soda is also formed; and it is a known fact of hydrostatical science that the introduction of any soluble salt into a fluid affects, in definite ratio, its specific gravity; but it is *not* known to what extent this salt, formed within the fibres of an absorbent fabric, and within the substance of a film of coagulated albumen, will dissolve out into the solution upon which such fabric and such film may be floated for a few minutes. A very few moments intelligent reflection will, however, we think, suggest, under ordinary circumstances, that a portion so inconsiderable as in no way to shake confidence in the hydrometer, as an approximate guide, finds its way into the bath. The first element in arriving at this conclusion, is the fact that, as a rule, the amount of chloride of sodium used is about one-sixth of that of nitrate of silver. So that, to suppose a case, if a quantity of paper which had used up completely ten ounces of solution containing ten grains to the ounce of chloride of sodium, were excited on a silver bath of thirty ounces, the solution would be reduced by this process to twenty ounces; and if the whole of the nitrate of soda formed were dissolved into the bath, and for a rough estimate balancing the extra quantity of nitrate of soda formed by the decomposition of the chloride, which would be about one-third, against its inferior specific gravity to nitrate of silver, which is about one-third, we should have one hundred grains added to the remaining twenty ounces, which would disturb the registration obtained by specific-gravity just five grains in each ounce of solution.

But there are two other considerations which reduce the amount of possible or probable error very considerably. The first is the fact that the nitrate of soda would commence accumulating in the bath from the first, so that some portion would have been carried away in the solution on the surface of every sheet; thus even if, as we have assumed, it had all been dissolved out of the paper, the whole could not have remained in the twenty ounces of solution left, again diminishing the probable ratio of error.

But of more force than any other consideration is, the well-known tendency of soluble salts to remain with the greatest pertinacity in the texture of absorbent substances, such as paper, especially when aided by a film of coagulated albumen. Mr. Cramb informs us that nitrate of silver can permeate the film of coagulated albumen to form the chloride of silver—that of course is a fact never doubted. We have seen a thickness of half an inch of coagulated albumen permeated by nitrate of silver. But Mr. Cramb adds, that "the same *liquid* which *brings* the one *can* and will take the other." Just the whole question in dispute, Mr. Cramb; but to admit that assumption would be to ignore entirely the existence of absorption. How gladly would the photographic printer hail this as a fact; how gladly would he learn that a soluble salt was just as easily and rapidly eliminated from his paper as it is passed into its fibres. But is not Mr. Cramb aware that his print will absorb in ten minutes a quantity of hyposulphite of soda, which twice ten hours of running water will sometimes fail to take away. The same liquid that brought it in, can and will take it out; but it requires many hours and much coaxing to do so. That some portion of the small amount of nitrate of soda will be soaked into the bath, there can be no doubt; but, arguing from analogy, the probable amount passing into the bath during a few minutes floating will be inconsiderably small. That the hydrometer should give, then, sufficiently reliable approximate results for general printing purposes is no violation of "known principles of chemical and hydrostatical science," but in perfect harmony with their wide and intelligent recognition. Let us not be misunderstood, however. There are, doubtless, circumstances when, from the accumulation of the nitrates of soda or ammonia, animal matter, &c., the specific gravity of a solution is not, and cannot be, an entirely reliable guide as to the amount of silver it may contain. To meet such cases comes Mr. Hughes' advice, that the analytical test be used occasionally, once in a week or two, for verification or for ascertaining how far the solution is in a state to allow the hydrometer test to be regarded as indicating, approximately, the strength of the printing solution.

Mr. Cramb will doubtless point to the results of his experiments. It might be quite sufficient to point in answer to those of Mr. Hughes, the accuracy of which we can attest. But those of Mr. Cramb are too contradictory for a satisfactory theory, apart from all other considerations. A special test-bath on which paper was excited sufficient to use four ounces and a half of the solution in one day, was found to register an error of eight grains to the ounce by the hydrometer test. The amount of solution used being again added, and the proper strength made up, the next day five ounces were used, and the hydrometer then gives, with the residue, error to the extent of seventeen grains to the ounce. The third day, the same course being adopted, and four ounces of solution used, when the residue is tested, instead of giving a similar ratio of error, which would have made the deviation twenty-four or twenty-five grains to the ounce, it is only eighteen. Again, we have the results obtained on testing a collodion bath, showing, by the hydrometer test, eight grains to the ounce of solution more than it really contained. What we are to assume from this it is difficult to say: but the first conclusion would be that, ignoring the effect of ether and alcohol, and admitting that the whole of the base of the iodide had been dissolved out of the film into the bath, not less than two ounces of collodion had been excited in every ounce of silver solution. We fear that, with every respect for Mr. Cramb's careful and intelligent experimentalizing, most photographers will be disposed to think that some error of manipulation or calculation must have escaped his attention here and elsewhere.

In conclusion, we may add that the hydrometer test has been in constant use with the most comptetely satisfactory results amongst many of our best printers for many years, and has the sanction of some of our best photographic chemists. Our readers need not fear, therefore, to act on Mr. Hughes' advice: use an analytical test occasionally for exact accuracy, and the hydrometer daily, as a rough, but honest guide.

THE ALBUMEN NEGATIVE PROCESS.

As this process appears just now to be exciting some attention, and, to judge by our correspondence, several of our subscribers appear anxious to give it a trial, we think that a succinct and detailed account of the various manipulations will prove acceptable to those to whom the process is not familiar—to whom the mere statement of formulæ recently given by Mr. Richards may be insufficient.

In a former volume will be found a very full description of an albumen process, by Mr. Negretti; but, as he himself remarks, his method is little suited to amateur use. We shall now select for description a modified process introduced by Mr. Whipple, by which, from its extreme simplicity and certainty, we think the humblest skill may produce good pictures.

1.—Take a pound of lump sugar, and dissolve it in half a pint of clean rain-water, then boil the solution for five minutes, and pour it into a stock-bottle for use.

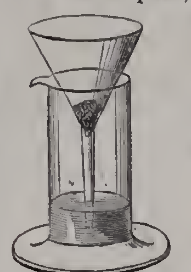
Select always the largest eggs, and as fresh as they can be had. If it is intended to work upon stereoscopic plates, one or two eggs will be quite sufficient to use at a time, as, although the mixture will *generally* keep for a month or more, it sometimes becomes deteriorated much sooner; it is, therefore, advisable not to tax its keeping qualities too severely.

The mixture for coating the plates consists of—

2.—Albumen (one egg)	1 ounce
Syrup (1)	½ ,,
Iodide of potassium	7 grains
Bromide of potassium... ...	3 ,,
Rain-water	1 drachm

The iodide and bromide should first be dissolved in the water, then added to the other ingredients, and the whole placed in a six or eight ounce bottle, which must be shaken vigorously until it is all reduced to a froth. This must be laid aside for at least forty-eight hours, when it should be filtered into a clean bottle, and a small piece of camphor added.

To coat the plate, prepare two small measures, and a funnel that will stand conveniently in them.



Throttle the funnel lightly with a piece of sponge, or wool, and filter through it, into one of the measures, sufficient albumen to cover the plate with. The glass plate, made scrupulously clean, and placed in a pneumatic holder, may now be coated by pouring on the albumen in the same way as collodion, the excess being poured off into the second measure. The first measure must be used exclusively for filtered albumen, by which precaution, all danger from bubbles or dirt may be avoided. The same albumen may be again filtered into the first measure for the next plate, and so on till the whole is used up; or, if all be not required at one time, it may be put back into the bottle for a future occasion.

After draining the albumenized plate about ten or fifteen seconds, it must be laid for a minute upon a levelling stand in order that the film may equalize itself upon the glass: then, holding it at the corners between the finger and thumb, it must be dried over the flame of a spirit lamp, or gas jet, beginning at the corner opposite to that where the albumen was poured off. The plate should be kept, during this operation, constantly moving, that the film may not be burnt, and it must be held slightly inclined so that the excess may drain off from the same corner as before, which must be wiped from time to time upon a piece of clean filtering paper. When the plate is *quite* dry, which may be ascertained by touching lightly the corners, it must be laid aside for a few minutes until it is sufficiently cool to be placed in the bath without jeopardizing the glass—but it is best not to let it get quite cold; when ready, plunge it with one movement into a bath of—

3.—Nitrate of silver	... ...	45 grains
Acetic acid ...	... ...	1 drachm
Distilled water	... ...	1 ounce

The plate should remain in this bath about half a minute, after which it must be well washed with common water. This may be done either with a washing bottle or under a tap, or the plate may be placed in a pan of clean water for a short time, and moved up and down with a horn or silver hook. The object of this washing is to remove the free nitrate of silver from the film, which tends by its presence to promote spontaneous decomposition in the dried plate, and thus injure its keeping qualities, while it does not add to its sensitiveness. It is desirable, therefore, that the whole of it should be removed, so, after a thorough washing, the plate must be placed in a bath or pan of—

4.—Common water	... ...	1 ounce
Chloride ammon.	... ...	2 grains

and left in this solution for at least a minute, that any remaining nitrate of silver may be converted into a chloride.

A thorough washing with common water, to remove the excess of the saline bath, completes the preparation of the plate, which may be left to dry spontaneously, or dried before a fire without flame.

We are not of those who decide upon the merits of a process by the number of plates that can be prepare . by it in given time; but it will be seen that the "albumen" process may vie with most for the simplicity of its formulæ and manipulations.

The time of exposure will, of course, depend upon circumstances, but albumen plates will generally be found to require a rather longer exposure than collodio-albumen. This, however, is a point that the operator can best decide by experiments. Of the two faults, it is better to over-expose than under-expose, as the former may be corrected in developing by using weaker solutions; but the prolonged development necessary to bring out the dark parts of an under-exposed picture is apt to mar the beauty of the half-tints for which this process is so justly celebrated.

The best developer for albumen is without doubt gallic acid: it is also easier of application than either pyrogallic or iron, for its effects are produced more slowly, and the plates, therefore, do not require so much personal attention. Having well cleaned a glass or porcelain pan (gutta-percha will *not* do for this part of the process) with cyanide of potassium, pour into it sufficient just to cover the plate of a saturated solution of gallic acid, which will be found to be nearly—

5.—Gallic acid	... ...	6 grains
Water ...	... ...	1 ounce

to every ounce of this add ten minims of silver solution;

6.—Nitrate silver ...	... ...	5 grains
Water (distilled)	... ...	1 ounce

cover the pan over to exclude dust and light. In about a quarter of an hour the picture will begin to appear, and in two hours or less, according to the amount of exposure, all the details will be visible. If desirable, a little more silver may be added now; but a plate that has had a proper exposure should not need it: in no case should any more silver be added until all the required detail is well out, otherwise the other portions of the picture will exhibit too great a contrast and appear hard.

Should it be found difficult to make the water dissolve the quantity of gallic acid we have named, gentle heat may be used, which will hasten the operation. Indeed, we mentioned the necessary strength of the solution purposely, because persons who are not accustomed to use this salt are apt to mistake the point of saturation. The gallic acid may be employed hot if it be wished to shorten the time of development.

We should notice that a photographic picture upon albumen obstructs chemical light in a much greater degree than one of a similar apparent density upon a collodion film, and therefore the development must be stopped at a point less dense in appearance than would be considered desirable for a collodion negative.

The ordinary pyrogallic acid solution may also be employed with albumen in the usual way, but it is questionable whether the results equal those produced by gallic acid. The strength of the pyrogallic solution should be—

7.—Pyrogallic acid	... ...	1½ grain
Citric acid	... ...	1 "
Distilled water	... ...	1 ounce.

Place the plate on a levelling stand, and thoroughly moisten the surface with clean water. Having drained the plate, pouron the pyrogallic solution, with an addition of five minims of the silver solution (6) to every drachm of developer. In about five minutes the picture will begin to appear. As with gallic acid, no moisture should be added until all the details are quite clear, and only then if really necessary. The solution generally remains clean until the development is complete; but should it discolour much it should be renewed.

The picture must be fixed with hyposulphite of soda in the usual manner. Unless a very large number of positives are required to be printed from it, the negative will not require to be varnished, as the film is very hard, and the picture well in it.

We think the above description will enable any of our readers who may wish to try this process, to do so with success, for it is very uniform in its results when worked with ordinary care. It has at least this advantage, that the *raw material*, albumen, is attainable in its greatest perfection by those who live away from the chief sources of collodion, and to these it may be worth serious attention.

Scientific Gossip.

Some important researches on solar light have recently been communicated by Kirchhoff, to whom, with Bunsen, we already owe so much of our knowledge on this subject. He has succeeded in presenting us with a chemical analysis of the solar atmosphere, by means of an examination of the spectra shown by various chemical substances, and a comparison of these with that of the sun. The author maintains that the sun has an ignited gaseous atmosphere which encloses a core of still higher temperature; and if we could see the spectrum of this atmosphere we should detect the bright lines which are characteristic of the metals existing in it, and should recognise the metals themselves from these. We however see what Kirchhoff calls the *inverted* lines, *i. e.* the lines dark on a luminous field, instead of luminous on a dark field, owing to the body of the sun being of a higher temperature than that of the atmosphere in front of it. A very perfect apparatus was employed, consisting of four large flint-glass prisms, and two telescopes properly mounted. With this the spectra were seen in a hitherto unattainable degree of distinctness and purity. Thousands of lines being exhibited in that of the sun, and those of artificial flames being likewise shown with equal distinctness, provided they were sufficiently luminous. A gas flame was not hot enough, but the sparks from a large Ruhmkorff's induction coil yielded very brilliant spectra of the metals which formed the terminals of the poles. A very simple arrangement permitted the comparison of the spectra of two sources of light. The rays of one of the sources may pass through the upper half of the vertical slit, whilst those of another passes through the lower half. When this is the case, one of the true spectra is seen immediately below the other, and it is easy to see what coincident lines appear in both.

In this manner the author satisfied himself that all the bright lines peculiar to iron correspond to dark lines in the solar spectrum. In the portion of the spectrum between D and F about seventy particularly well defined lines occur, resulting from the iron in the sun's atmosphere. Iron is remarkable on account of the great number of distinct lines which it produces in the solar spectrum; magnesium is interesting, becauso it produces the group of Fraunhofer's lines lying in the green denoted by Fraunhofer by *b*, and consisting of three very strong lines. Very distinct dark lines in the solar spectrum correspond to the bright lines produced by chromium and nickle, and we may, therefore, regard the presence of these substances in the sun's atmosphere as proved. Silver, copper, zinc, lead, aluminium, cobalt, and antimony, have extremely brilliant lines in their spectra; but no distinct dark lines in the solar spectrum correspond to these.

Wonderful accounts having from time to time been published respecting the optical properties of "The Silver Spring" of Florida, the professor of natural philosophy in South Carolina College determined to investigate its properties. As might be expected, the so-called mysterious and wonderful phenomenon which popular report had ascribed to the waters of this spring, were at once seen to be due to well known physical principles; but the account which Professor Le Conte has given of his examinations is so interesting, and the subject—that of the properties of pure water—is so important to all photographers, that we are induced to give a brief abstract of the report which has recently been presented to the American Association for the Advancement of Science. This remarkable spring consists of a basin nearly circular in shape, about 200 feet in diameter, and is surrounded by hills covered with oaks, magnolias, bays, and other gigantic evergreens. The maximum depth of water was found to be not more than 36 feet in the deepest part; the reputed depth was in the neighbourhood stated to be 80 feet; on the borders of the spring this was reduced to 45 feet; whilst in distant parts of the country it was stated at 150 feet; thus affording an illustration of the general law that the accuracy of popular statements bears an inverse proportion to the distance from the point of observation; probably like all emanations from centres, following the law of inverse squares. The most interesting phenomena presented by the spring is the truly extraordinary transparency of the water, in this respect surpassing anything which can be imagined. All the intrinsic beauties which invest it are directly or indirectly referable to its almost perfect diaphaniety. On a clear and calm day, after the sun has obtained sufficient altitude, the view from the side of a small boat floating near the centre of the spring, is beautiful beyond description, and is well calculated to produce a powerful impression upon the imagination. Every feature and configuration of the bottom of this gigantic basin is as distinctly visible as if the water were removed and the atmosphere substituted in its place. A large portion of the bottom of this pool is covered with a luxuriant growth of species of water-grass and gigantic fresh-water algæ, which attain a height of three or four feet. The sunlight illuminates the sides and bottom of this remarkable pool as brilliantly as if nothing obstructed the light. The shadows of the little boat, of the observers' overhanging heads and hats, of projecting crags, &c. of the sorrounding forest, and of the vegetation at the bottom, are distinctly and sharply defined, while the constant waving of the slender and delicate moss-like algæ, by means of the currents in the water, and the swimming of numerous fish above this miniature subaqueous forest, impart a living reality to the scene which can never be forgotton; and if we add to this picture, already sufficiently striking, the fact that objects beneath the surface of the water, when viewed obliquely, are fringed with prismatic hues, we shall cease to wonder at the mysterious pheomena with which vivid imaginations have invested this enchanting spring, as well as at the inaccuracies which have been perpetuated in relation to the wonderful properties of its waters. On a bright day the beholder seems to be looking down from some lofty airy point on a fairy scene in the immense basin beneath him, a scene whose beauty and magical effect is vastly enhanced by the chromatic tints with which it is invested. Numerous comparative experiments were executed in relation to the distances at which cards could be read in air, and at the same distance beneath the surface of the water; the results of which were that when the letters were of considerable size, on a clear and calm day they could be read at about as great a vertical distance beneath the surface of the water as they could be in the atmosphere. The distances were chosen from between six and thirty feet. These results are very remarkable, since Bouguer, in the results of his experiments on the absorption of light by sea-water, estimated that at the depth of 311 French feet the light of the sun would be equal only to that of the full moon, and at the depth of 679 feet would wholly disappear. A redetermination in a more careful manner should, therefore, be made of the transparency of the water of the "silver spring," as the absorption of light by water is a very important subject for photographers as well as scientific persons in general. Should it turn out (as seems most probable) that water in its perfectly pure state is almost as transparent to light as air itself is, there will be no difficulties, other than mechanical ones, in the way of enterprising photographers obtaining pictures of submarine scenery; and from the above description of the clearness of the above spring it is very probable that a water-tight camera lowered down to the bottom, and there connected with suitable apparatus for uncovering and covering the lens, would produce a true subaqueous photograph of the wonderful scenery described. In any experiments of this sort the front surface of the lens should not be allowed to come in contact with the water. The curvatures of the glasses are all calculated on the supposition that the rays of light pass out of a rare medium like air, into the glass. If, instead of air the rays passed direct from the water to the glass, the focus of the combination would be considerably lengthened. This difficulty could be overcome by cementing a piece of plate-glass with parallel sides in front of, and about an inch from the first surface of the lens, which would prevent the water from touching the curved surface of the lens, and as the rays would pass through a *plane* boundary surface of water, instead of a curved one, these errors would be in great measure obviated.

There would still be a difficulty as to the proper focussing of the picture on the ground-glass, which, unless the photographer cared to go down in a diving-bell or diver's dress to the camera, would have to be done at the surface by guess. We have previously heard of a submarine photograph having been taken. If we mistake not, one was spoken of some years ago as having been taken of the bottom of Weymouth harbour; but we are not aware that any detailed account of the way in which this was taken has ever been published.

Notes and Jottings.

No. V.

Testing Nitrate of Silver Solutions.—Manipulation in the Operating Room.

Some attention has lately been given to the various methods of testing the strength of nitrate of silver solutions. Mr. Hughes, in his paper read at the last meeting of the North London Photographic Association, particularises the several instruments which have been invented for that purpose, but as amateurs may not care to expend even a few shillings in the purchase of one of them, if they can with equal readiness and certainty employ articles which they have in use, we will give the simple method we have been in the habit of adopting.

A stock-bottle of testing solution is always kept in the operating room. It is made thus: pure well-dried chloride of sodium 35 grains; water 100 ounces. One ounce of this solution precipitates as chloride one grain of nitrate of silver. It is therefore evident that any given quantity of silver solution, the strength of which it is required to ascertain, will demand for each grain to the ounce, exactly the same bulk of testing fluid.

Thus, by way of example, let us take a drachm of our printing bath, the strength of which was originally 60 grains to the ounce. Add to it one drop of a saturated solution of bichromate of potash, which should also be kept in stock; we thus obtain orange red chromate of silver, *which loses its colour the moment the full quantity of testing solution is added.* Now add testing solution as long as a precipitate (chloride of silver) falls, or until the silver loses its red tint, the number of drachms so added will exactly equal the number of grains of silver in the solution tested, so that if, say fifty-five drachms be added, each ounce of the nitrate of silver solution will contain fifty-five grains of the latter salt.

The convenience derived from the testing solution being of the strength given, is very great in practice, as it simplifies the calculation very materially. It is by no means needful that even graduated measures should be used; for if we take, say, a wine-glassful of nitrate of silver bath, and find that thirty glassfuls of testing solution will be required to saturate it, then we know that the solution tested contains thirty grains to the ounce.

A short time since we visited the establishment of one of our most eminent photographers, and noticing a few items of manipulation that we thought would interest our readers, we made a jotting of them for their benefit.

The first matter that came under our notice, was a plan for keeping the nitrate of silver bath at an even temperature. To effect this, a water-tight case constructed of wood, having a tap at the bottom, received the gutta-percha bath, leaving a space round it to hold water, which in winter should be warmed, and in summer cooled by ice, so as to bring the temperature to about 60°. The importance of careful attention to see that the bath is neither too hot nor too cold, is a point frequently overlooked even by many professionals, who consequently have to complain of fogging in summer, and dull weak negatives in winter.

Next we observed a simple plan for obtaining a gentle, even stream of water for washing the plate, which the amateur might adopt with considerable advantage in dry plate photography. A length of gutta-percha tubing, pierced with small holes, was fastened to a water-tap, so that a line of small jets spouted on to the plate, placed on a fitting stand. In this position the operator left it to be entirely freed from hypo, while he went on with other matters.

The mixing of the iron and pyrogallic developers lately brought to the notice of the public, had been in use for some time. The method of manipulating differed somewhat from that usually followed. The image was first developed by pyrogallic acid only, and the iron afterwards added to bring out the half tones. Of course, when then the two solutions were mixed, ink was formed; but this did not influence the result. Michael Hannaford.

ON THE PRINCIPLES OF COLLODIO-ALBUMEN PHOTOGRAPHY.

BY THOMAS SEBASTIAN DAVIS.*

In continuation of my report in elucidation of the principles involved in the preparation of dry plates, I have to record the general results of my experiments in connection with the employment of albumen in unison with the excited collodion film. The practical difficulties that have beset the use of such plates, may be described as consisting in a rapid deterioration after preparation, the want of uniform sensibility, liability to blistering, and a general tendency to stains and markings. With regard to the first difficulty, viz., deterioration after preparation, a lengthened experience leads to the inference that free nitrate of silver, in union with albumen, forms a compound prone to decomposition. It becomes, therefore, a question of primary interest to ascertain how far the sensibility of the collodion film can be preserved, without bringing the albumen into collision with free nitrate of silver. To ascertain this point I prepared a plate by covering it with collodion, decomposed the sensitizing salts in the usual nitrate of silver bath, and then washed thoroughly with an abundance of pure water. I then poured over its surface a mixture of dilute albumen, and finally treated it with water at a high temperature (about 200° Fah.) Upon developing the picture, after an exposure of ten minutes, with a Ross's stereo 4½-inch lens, in a fair light, I obtained a result which indicated slight under-exposure. It seemed to me desirable to ascertain in the next place, whether, under similar circumstances to the above, pure iodide of silver be more or less sensitive to the actinic impression than the iodide of silver in combination with the chloride and bromide. In pursuance of the enquiry, I first prepared two samples of collodion, the one I sensitized with iodide of cadmium alone, and the other with a combination of iodide, bromide, and chloride salts. I then prepared two plates with the iodized collodion, and upon removal from the nitrate of silver bath subjected them to a prolonged washing in *pure* water. The one was preserved with my raisin extract preservative solution, and the other with dilute albumen, and each subsequently washed, dried, and exposed. Two other plates were next prepared with the collodion, containing both chlorides and iodides in solution, plunged into a solution of chloride of ammonium, then washed freely with common water, treated respectively with the raisin extract and albumen solution, and lastly washed and dried. It will be noticed by the above treatment we obtain two films containing iodide of silver, and two others, in which the iodide is in intimate admixture with the chloride. In comparing the relative sensibilities of two photographic surfaces to the action of light, I have found it necessary to expose them simultaneously, otherwise the variation in the actinic intensity within a few minutes is calculated to lead to false inferences. To avoid any source of error from this cause, I exposed the plates, prepared as above, in two cameras fitted with corresponding lenses, and found on development that under the above-mentioned circumstances the iodide of silver, plus chloride of silver, gives evidences of possessing a greater sensibility than iodide of silver minus the chloride. The relative difference may be estimated ar three is to four in respect to the plates prepared with the raisin extract, and as two to three between the two prepared with the diluted albumen. The above experiments indicate, however, that the collodio-albumen plates can be preserved in a sufficiently sensitive condition for general landscape purposes, without the conversion of the albumen into the compound that is recognised (whether correctly or not) by photographers as the albuminate of silver. It seems, however, desirable to ascertain the proportionate sensibility between a plate prepared with or without the formation of the albumino-nitrate of silver compound. Perhaps the most sensitive surface that can be produced of this character is by following the Taupenot process, and using the second bath in a neutral state. Although

* In continuation of the Report of the Experimental Committee of the South London Photographic Society upon the Dry Processes.

the plate in this condition is exceedingly deficient of keeping qualifications, it yet possesses considerable sensibility. The result of some comparative observations upon the subject, lead to the inference that Taupenot plates so prepared have about twice the average sensibility of those containing a combination of iodide and chloride of silver, and preserved with plain albumen. I do not find that any increased sensibility is attainable in the latter instance by treating the washed albumenized plate with a solution of gallic acid. I am inclined to deduce as a general inference, from varied experiments on the subject, that a layer of albumen intervening between the silver salts and the excited collodion film, or the presence of insensitive salts upon or within its interstices, are directly antagonistic to photographic action. Without having recourse therefore to any theoretical speculations with regard to physical modifications of structure, we are enabled to explain satisfactorily the principles on which the various modifications that have been successfully applied in connection with collodio-albumen photography depend for their practical value. It will be noticed throughout that in those cases in which the albumen does not contain iodides, it need not be brought into contact with the nitrate of silver solution, but that it becomes advisable, as noticed by Mr. Fothergill, to remove from the surface of the film the greater portion of the insensitive coating. If the albumen has become dessicated, or partially so, by spontaneous evaporation, it will be found more efficacious to use hot than cold water to effect its removal. The superior efficiency of the former will be apparent if we coat a piece of glass with liquid albumen, dry it at a high temperature (say 200° Fah.) then attempt to wash it from the surface of the glass by the aid of cold or boiling water. It will be noticed that although the layer of albumen resting simply upon the surface of the glass is not coagulated by the heat applied, it has been rendered less easily soluble in cold water. If moreover we dip the glass covered with the thin film into boiling water, we shall not find that any opacity is produced indicative of a structural alteration in its character. Although I am inclined to the belief that the same reasoning would apply to a layer of albumen resting upon the surface of the collodion film, yet we do not possess any demonstrative experiments to show that it would equally be applicable to the portion retained within the interstices of the film, in intimate proximity with the metallic salts. At all events it is to be observed that those experiments which have been adduced in favour of increased sensibility attributed to structural alteration, are explicable upon the simple principle of a removal of the insensitive or even antagonistic influence of the preservative agent. Regarded in the light of the theory advocated, in conjunction with the fact of the possibility of preserving the sensibility of the collodio-albumen compound, without the necessity of bringing the albumen in contact with free nitrate of silver, as shown by my experiments, we can easily understand the unity of principle existing between the preparation of plates by the Fothergill, Petschler, and other published methods of manipulation.

I have now, in conclusion, to offer an opinion with reference to the best practical method of preparation; or in other words, the one which offers the greatest number of general advantages as a dry plate process. As the preference must be made in subordination to special requirements, it is advisable to state that the leading qualifications which I consider a dry plate process ought to possess are these, facility and readiness of obtaining uniformity of preparation, moderate sensibility, certainty of results, one sensitizing bath, and considerable keeping qualities. I am inclined to think that the great care that would be required to preserve plates in an unimpaired condition, the lengthened period of exposure during preparation and development, the necessity for the avoidance of any contact with deleterious vapours would militate against the utility of dry plates possessing equal sensibility with ordinary wet ones, when required for general landscape delineation. In those cases in which a greater sensibility than one half or third of that of wet collodion be requisite, the balance of advantages will in all probability remain in favour of the wet or preservative process.

In subjection to the above considerations and experiments, and to meet the exigencies of ordinary landscape or still-life photography, I have devised, and would generally recommend the following collodio-albumen dry process.

Take six fluid drachms of any good negative collodion of a non-contractile character, and add thereto two drachms of the following sensitizing solution;—

Iodide of potassium	8 grains
Iodide of cadmium	16 grains
Bromide of ammonium	2 grains
Chloride of ammonium	1 grains
Alcohol ·805	6 fluid drachms

Digest for three or four hours with occasional agitation, carefully filter, and add two additional drachms of alcohol so as to make up to one fluid ounce. Sensitize the plate in the ordinary 35-grain neutral nitrate solution, immerse in a dish of (pure) water, to which has been previously added a drachm or two of a five per cent. solution of chloride of ammonium, remove and wash thoroughly with ordinary filtered water. The plate is then to be covered with the following preservative solution:—

Raisin extract solution (Raisins 1 fluid drachm, water 5 fluid drachms)	1 ounce.
Albumen	1 ,,
Ammonia	10 minims.

Agitate the whole together in a large bottle, and filter through sponge just before using.

The first quantity applied should be made to flow over the plate in a continuous wave, and be poured off at once from the opposite corner; the second be permitted to remain thereupon not less than a minute. The plate is now to be washed freely with filtered water applied from a jug, or other convenient manner, then stood on end to dry spontaneously, or by the application of a gentle heat, and is ready for use. After exposure the dry plate should be moistened with distilled water, and developed with the following solution:—

Pyrogallic acid	1½ grains
Citric acid	½ grain
Water	1 fluid ounce
(Alcohol	10 minims

Add to each fluid ounce about half a drachm of a 15-grain solution of nitrate of silver. Fix with hyposulphite of soda, wash, spontaneously dry, warm, and varnish as usual.

February 13th, 1861.

Photographic Tourist.

PHOTOGRAPHY IN JAVA.*

ACCOUNT OF A SHORT PHOTOGRAPHIC RAMBLE THROUGH THE INTERIOR OF THE EAST END OF THE ISLAND.

We had now been staying four days at Paree, during which time we had photographed all of interest in the neighbourhood, and it was then our intention to have proceeded to Ngantang, but the controleur, (a Government official, whose duty it was to examine all the coffee lands belonging to Government), having arrived, we determined to stay a few days longer, and accompany him in his inspections in the district, giving us a chance of seeing a deal of the surrounding country.

We also had an opportunity of seeing the reverence Government officials are held in by the poorer classes of the Javenese, as in riding along the roads all the coolies kneel on the ground, and hold their hands in a praying position until he has passed, even the chief of the place (who with strangers quite affects European manners), sits only on the ground in his presence.

Some years ago the district had its own controleur, who met with his death in an extraordinary manner, the circumstances of which I will relate as told to me by the Javanese. I must first state how we came to hear of it.

We had been told of some ruined tomb at a short distance (which we wished to see whether worth photographing or not), adjoining which was a shed containing a box of clothes, supposed to have been worn by the chiefs of the place some 700 years ago; these being held in great reverence by the natives, having always a guard of five men, who, at their death, are replaced, we were naturally anxious to see the place at all events; but on asking assistance from the chief, he, to prevent our going, told us that if we were decided on seeing it we could, but that we should be certain to get into trouble, as no European had ever been there without subsequent misfortune. As an instance, they cited

* Continued from p. 79.

the case of the controleur before mentioned, who, regardless of the Javanese superstitions, entered the place, and dressed himself in the garments; the consequence of which, they say, was that he could not go from home afterwards without meeting a tiger; and on going a journey one day to Kedirie, on passing the jungle mentioned at the commencement of this journal, a tiger sprang on to his carriage, and, without harming, so affected him with fright, that he died shortly after returning home Many of the European residents verify the fact of his meeting the tiger and his subsequent death, and also say, that if we had persisted in visiting the place, and had not met with misfortune, that they (the Javanese) would have brought it on to us by producing dysentry, or other sickness, which they are very expert at, merely for the sake of verifying their prophecies. But the Government of Dutch India wisely do not allow these superstitions to be interfered with even by their own officials.

The controleur having left, in the evening we proceeded to pack up our things, but on examining the chemicals found the cyanide of potassium was missing; this was rather annoying, as we were upwards of a hundred miles from where we could procure more, and we were doubtful whether any pictures taken in the meantime, and not fixed, would keep until we could get another supply, which would at least take a week, as one of us was obliged to go on horseback to the seaport of Pasoeroan, where we had a relay of materials, and from which a stranger would not have been able to select the right one; the only explanation of its loss was that some of the men about the place had heard of its poisonous properties, and thought it might be made useful; we offered a reward of fifty rupees, but without effect.

During our stay at Paree our table consisted of several strange dishes,—peacock steaks, very much resembling veal; a kind of fat caterpillar found in the rattan, which, though rather offensive to the sight, are very delicious, and considered the greatest delicacy by the Javanese; the legs of a large species of bat, measuring five feet across the wings; and above all the young shoots of the rattan which, forming as it does in England, an important addition to the dress of ladies, here makes us an excellent substitute for asparagus, which in taste and appearance it closely resembles, of other vegetables we had none, rice generally taking their place.

On the following day, after the departure of the controleur, we started off twenty-seven coolies with our apparatus, wearing apparel, a case of wine, and one of provisions, as we intended to stay some time at Ngantang, our destination, and every one requiring so many clothes in a hot climate makes the baggage rather heavy.

After riding on the road a few miles we came upon a splendid banyan tree, stretching its roots over a large surface of ground, but as usual without being able to get a single point of view, owing to its immense size; we, therefore, rode on to our intended destination for the night, a small village which had also its place of accommodation for travellers; but the people being taken by surprise, not expecting anybody, shut themselves in their houses, and gave out that they were all away. It being by this time rather late in the day, and having as yet had nothing to eat, we all felt rather peckish, but could get nothing from them; but having, luckily, with us a peacock, shot the previous day, and having taken possession of the pasangrahan, we set to work to grill part of it, what with this, a tin of "pate de fois gras," one of biscuits, and a bottle of wine, and the assistance of a Chinese opium seller in the neighbourhood, who sent us cakes, oranges, and tea, we did not fare so badly; so after giving our horses grass which we ordered our coolies to cut, we determined to push on to Ngantang (about 11 miles further) that night, as there was no chance of our getting sleeping accommodation where we were.

As the road had (from our starting-place) hitherto been through a flat country, and now commencing to mount the hills, we found the atmosphere cooler at every step, as we had to follow the mountain ridges sometimes falling 300 feet on each side, the views around us were truly grand.

At every turning something new would burst upon us, some distant stretch of country, or lovely vale; mountain ferns also made their appearance, never seen in the lowlands; after mounting hill after hill, to the height of perhaps 3,000 feet above the sea, we commenced gradually to descend, the road at last opening out into a long valley, at the other end of which lay our destination; our horses were by this time nearly done up, the continual ascent having been too much for them, after previously coming such a distance; an English horse would, perhaps, go twice as far without giving in, but here the horses are not larger than an English pony, making them, of course not able to endure near the same fatigue.

By the time we arrived we were nearly as wearied as our horses, having been exposed to the sun ever since early morning, and were very glad to rest ourselves.

Ngantang is about one of the prettiest situated places in Java, being shut in on three sides by mountain ranges, the volcanic mountain Kloet rising in front to a great height, rice fields and cocoa-nut plantations reaching to its foot.

Lying, as Ngantang does, some 1,700 feet above the level of the sea, the climate is very agreeable, at night being so cold as to require two or three blankets, though in the middle of the day, and in the direct rays of the sun, being nearly as hot as in a lower district.

The pasangrahan, unlike the one at Paree (which having been the residence of a European was built of stone) was in the true Javanese style, built of matting, and roofed with jungle grass, having a room built in front open at all sides, for use during the day.

Having arranged all things satisfactorily for our comfort, our first few days were spent in taking walks and rides in the neighbourhood, selecting the best views so as to lose no time in our operations when we should receive the cyanide.

Living, as we now had to do, far from European society, and having none but Javanese to talk to, the time passed rather monotonously, also our having so many nice views in the neighbourhood, and our not being able to take them, several within a short distance of the house we tried, instantly transferring them to a dark place to be fixed at a future time, but with the uncertainty as to whether they would remain unchanged, as we did not care to take our materials any distance, for fear that our labours might all be lost.

After eight days of impatience the cyanide arrived, and we proceeded in the first place to fix what few views we had taken, the cyanide acting as usual, though leaving a peculiar film slightly obscuring the transparency of the blacks, not, however, in any way affecting the picture as a negative

(*To be continued.*)

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 20th February, 1861.

There is a very ingenious method of gaining fame or notoriety, frequently resorted to by photographers, whose vanity overcomes every consideration of truth and honour. They find that by announcing the successful attainment (in their hands) of some desideratum in the art, which shall completely remove a host of difficulties that now beset the operator, or accomplish some marvel hitherto deemed hopeless or impossible, they achieve as much greatness as if they had really made the discovery.

Among the most notorious instances of this mode of cheating fame was that of the American, Hill, who unblushingly announced to the world that he had discovered the secret of photographing in natural colours. Of course, we had, for a time to believe the bold assertion, and Mr. Hill succeeded in gaining an extensive share of newspaper notoriety. But as for the promised secret, we have waited long enough for it, so long, indeed, that in the interim Mr.

Hill has sunk into his original obscurity, and earned well-merited contempt for his barefaced imposture. Other instances will doubtless occur to you, in which golden visions were raised of "unfading positives," "proofs without salts of silver," &c., &c., which, of course, have never been realized; but they have served the purpose of raising their proposers into temporary notoriety, and thus far, at least, have satisfied their object. With these *fiascos* in view, we naturally receive with caution and suspicion any announcement of wonderful results unaccompanied with ocular proofs. At the last meeting of our Photographic Society a member announced that he had discovered a process, which, as he *said*, was calculated to effect a considerable modification in the photographic processes now in vogue. He did not explain the nature of the modification, nor by what means he had been led to his discovery; he "wishes to perfect it before giving it to the world;" meanwhile, it has leaked out, that this discovery consists in obtaining direct positives on paper in the camera, with the "whites" and "blacks" of irreproachable purity. This, if my memory does not deceive me, is not the first time such a result has been announced as a *fait accompli*. I do not question its realization in the present instance, on the contrary, I would rather believe it than not; but, as I said before, experience prompts caution, and a disposition to believe only in ocular proof.

The solar camera continues to engage the attention of the scientific inquirer; and very elaborate discussions have taken place in our society both on the soundness of the principles upon which this instrument is constructed, and on the means by which it may be still further improved. The question has been greatly simplified by the observations of Mr. Leon Foucault; and I think that there ought now to be no difficulty in constructing a solar camera that shall fully realize all that has been expected or required of it.

I have seen no detailed description in the English journals of the American *Telesmatic* apparatus invented by Mr. Fontayne, which prints one thousand proofs or more an hour. A full account of this marvellous invention, upon which, it must be confessed, the world was somewhat sceptical, has recently come under my notice; and as I think it will be no less interesting to you than it has proved to us, I give you a summary of its principal features. The mechanism of the apparatus is extremely simple, and acts with as much precision as that of astronomical apparatus. In one hour 4,000 positives on paper can be printed from one negative, each measuring about an inch square. The paper upon which they are printed, as you may suppose, is not prepared with chloride of silver: the time of exposure is so short, that this salt does not offer sufficient sensibility: ordinary paper is sized with gelatine mixed with iodide of silver and other sensitive salts intended to produce a highly sensitive surface. This paper is rolled upon a cylinder, similarly arranged to that in the printing electric telegraph, which, set in motion by clockwork, unrolls itself slowly and regularly: the whole is contained within a dark box furnished with a single aperture. The negative slides within this aperture, and the sensitive paper is so arranged beneath it, that for a definite, but very brief period, it touches the negative. The mechanical apparatus is also so constructed, that the paper remains for about a second in contact with the negative, and at the same time, by an equally rapid motion, it opens and shuts a cap placed over the negative; while over the cap a condensing lens is placed, which throws the concentrated rays of the sun on the negative, and, consequently, on to the sensitive paper.

The complete action of the machine, you will perceive, is accomplished in the short space of a second of time: during which the paper is brought into contact with the negative, the cap opens, the paper remaining exposed to the light for about a second, and the cap is closed; again the paper moves, the impressed portion travels on, and a fresh portion of paper comes under the negative, to be impressed in its turn. By accelerating the motion of the machine, this action may be repeated one hundred times a minute, or six thousand times in an hour.

From 200 to 250 proofs are printed on each sheet of paper; they are removed to the dark room, and developed in the usual manner, with gallic acid, acetic acid, and nitrate of silver; and afterwards fixed in hyposulphite of soda. Thus, without exhibiting anything precisely new, this machine comprises a happy combination of the best means for securing the desired result, and when confidence in its power becomes established, it will doubtless come into extensive operation.

Mr. Retzinski gives the following description of his method of printing positives, which, from its economy, he considers worthy the attention of amateurs, who are generally so wasteful with their salts of silver.

To 35 ounces of albumen add 45 grains of chloride of sodium, heat into a froth, and allow it to subside for four-and-twenty hours, then filter in the usual manner.

The paper must be floated on the albumen for six minutes, when dry, sensitise on a silver solution of the strength of five per cent., or 22 grains of silver crystals to the ounce of water.

This bath may appear to be very weak, as the strength usually recommended is 20 per cent. But Mr. Retzinski thinks that he effects a gain of 75 per cent. of silver, with no disadvantage, except that the proofs require longer exposure in the printing frame.

The paper is floated on the silver solution forty-five seconds, and not longer. It is afterwards printed, fixed, and toned in the usual manner.

If you do not find much novelty in Mr. Retzinski's formulæ, it may be considered valuable for its economical suggestions, as the tendency among operators has of late ran into excessively strong silver solutions, which renders printing in the hands of amateurs a very costly business.

The proposal to adjourn the awarding of the De Luynes' prize of 8,000 francs for a successful method of converting photographic proofs into plates from which any number of proofs might be taken, either by lithography or the other methods of printing engravings, until the 1st of April, 1864, has been adopted by the committee. It is hoped that the additional time given to competitors will lead to a satisfactory solution of this most important photographic problem.

Among the conditions, exhibitors at our next Photographic Exhibition must comply with, I omitted to state, that the pictures sent must be accompanied by their title, the process by which they are taken, and the exhibitor's name and address; the price, if for sale, cannot be allowed to be affixed to the frames, but must be communicated to the secretary in the note of particulars accompanying the pictures. During the Exhibition no pictures can be removed from it but after it is closed they must be removed within eight days.

Proceedings of Societies.

Birmingham Photographic Society.

The ordinary monthly meeting of this society was held on the 29th of January, Mr. W. B. Osborn in the chair.

The discussion upon Mr. Rejlander's paper being resumed,

Mr. Turner said he had worked for six or seven years, but had never seen the scum on the bath until within the last six months, when, in consequence of the coldness of the weather, he had had a stove erected in his room. Since that had been put up, owing, he supposed, to the fumes of sulphur generated by it, he had frequently detected the scum. He believed that almost all the difficulties that photographers had to contend with were attributable to want of cleanliness. He made a point of filtering his bath every night, by means of a contrivance he found very useful. It consisted of a funnel fitted into a glass jar, a plug of cotton wool being inserted in the tube of the funnel. This effectually filtered the bath. On each side of the jar also was a tube on the syphon principle, and, by blowing through one, the bath could be filtered by means of the other, without disturbing the sediment that might have collected. He believed also that the want of care in cleaning the glasses was a very fruitful cause of this scum forming. He generally cleaned his glasses on both sides with nitric acid and water.

The Chairman said he had often observed that amateur photographers considered it quite sufficient to clean one side of the glass only, a prolific source of danger to the bath.

Mr. Turner said that at the last meeting Mr. Rejlander left two glass plates, which he complained of as resisting all efforts to clean them. He (Mr. Turner) cleaned one with nitric acid and water, and took a portrait of the Honorary Secretary upon it. Mr. Hart, he added, had cleaned the other with levigated emery and water, and had taken a picture upon it. The plates were now quite clean, and free from any markings.

Mr. Breese said, that in looking over some negatives a few days since, he found six which had cracked all over, and upon examining them he perceived that they were all upon *white* glass, while those taken upon glass with a green tinge had remained perfect. He was of opinion that the white glass absorbed moisture from the atmosphere, and acting upon the porous collodion film imprisoned under the hard varnish, caused it to swell, and finally to crack the varnish. He was borne out, he thought, in this opinion, by the fact that he had one negative kept in the same box (which was on white glass, but unvarnished) which had remained perfect.

The Chairman observed that he could endorse the last speaker's opinion, as he had frequently noticed this defect—vulgarly called "sweating"—in colourless or white glass.

Mr. Turner had used the colourless plate, and never found this defect.

Mr. Plante said his practice was, previous to varnishing the negative, to clean off a narrow rim all round the glass; then to warm it and pour the varnish all over it. By this means moisture was prevented from creeping under the film; and yet with all these precautions he had frequently found the films on the colourless glass, which films from lapse of time were split all over. He had also negatives which, quite clean when done, were now marbled all over, probably from the same cause. He found the best method of cleansing glass plates was to place them upright in a solution of one part sulphuric acid, four parts water, and after some hours to neutralise the acid with best chalk. This process covered the glasses with a very fine deposit of chalk, which, when rubbed off, gave a brilliant surface to the glass.

After some further conversation on the subject,

A number of choice photographs were displayed, as the presentation prints, the allotment being—one large print, two small ones, or six stereographs for each member. The Secretary then announced that Mr. Robinson, of Leamington, had, with great liberality forwarded one of his photographs for presentation to each member of the society.

After the usual votes of thanks the proceedings terminated.

Manchester Photographic Society.

The monthly meeting of this society was held on the 6th inst., Mr. Wardley in the chair.

Some correspondence was read in reference to the approaching meeting of the British Association. The Secretary, Mr. Mudd, Mr. Neild, and Mr. Sidebotham were appointed representatives.

A conversation on the panoramic and other lenses ensued.

The Chairman observed that much had been said lately about the centring of lenses; but the error that was likely to occur was of very little moment in those for landscape purposes. The subject of lenses being before the meeting, he wished to call attention to the importance of devising some method of expressing the capabilities of the various combinations now before the public, as compared with the ordinary landscape objective. The practice of measuring the focus from the back lens of a compound portrait, triplet, or orthographic, was erroneous in principle; consequently photographers, unacquainted with this fact, were liable to be led astray when they hear of a 3½-inch focus lens (compound form) covering a circle of nearly five inches. Upon trying a lens of this character, they would find the size of image and circle of good definition, equivalent to an ordinary meniscus of about 4½ inches focus. It would be much beter if the compound lenses were expressed in equivalents with our old landscape lenses.

[The practice which prevails amongst opticians, and of which Mr. Wardley complains, is certainly a delusive one. It has arisen, we believe, simply out of trade exigencies, and not from any desire to deceive. It has become a habit to state the focus from the back lens of a combination to guide the camera-maker as to the length of body required. If the equivalent focus were given to him as a guide, he would very probably make a camera in which the ground glass could not be brought near enough to the lens by an inch or two. We were once absolutely served so. Mr. Dallmeyer's new stereo lens, described as of 3½ inches focus, is about 5 inches equivalent focus. The best plan in describing a lens would be to state both equivalent focus, and focus from the back lens. No mistake could then occur.—Ed.]

City of Glasgow and West of Scotland Photographic Society.

The ordinary monthly meeting of this society was held on the 7th inst., J. Kibble, Esq., presiding.

Mr. Stuart showed some prints, produced by a photo-lithographic process, which he would not then disclose, but stated that it was different from any yet published.

Mr. John Cramb then read a paper "On the Testing of Used Silver Baths, and the Hydrometer Silver Meter."

After some preliminary observations on the subject, he described the method of testing silver solutions as follows:—"Having accurately weighed out 60 grains of pure dried chloride of sodium, dissolve in 170 drachms of distilled water. A bottle which is known to hold this quantity is a more convenient and also more correct method than a large measure with a great surface, which renders it difficult to observe the exact amount. Measure a drachm of the silver solution to be tested. Render acid by nitric acid. Put this into say a two-ounce phial, wash out the measure with distilled water, and add the washings to the silver solution. If you are sure there must be say 20 grains to the ounce of silver solution, add at once as much of the chloride solution as will precipitate the amount of silver. Then add carefully, little by little, shaking each time you add chloride. Observe how much chloride you have used before you again add a quantity. At a certain point precipitation will cease: you may add more chloride to make certain. But the quantity of chloride used *before* the point at which you observed there was no more precipitation is the quantity you found your calculation upon. Suppose a case, and say it required *three* drachms of solution of chloride of sodium to precipitate all the silver from the *one* drachm of solution operated on, proving that there were *three* grains of nitrate of silver present in the drachm of the bath tested, or equal to *twenty-four* grains of nitrate of silver to the ounce of solution." He then proceeded to state his conviction that the hydrometer was useless as a test for either collodion baths or printing solutions. "An old collodion bath might contain substances which would make it lighter than water—namely, alcohol or ether, or substances which would make it heavier, such as the nitrate of potash, cadmium, or ammonium, &c., or redissolved cotton, &c. In the printing bath there is no such disturbing cause. The error in using the hydrometer is always in one direction. The bath steadily, the longer it is used, acquires the more of heavy matter—nitrate of soda or ammonia." He then proceeded to comment on a recent paper read by Mr. Hughes at the meeting of the North London Photographic Society, and on the experiments illustrating it, adding that such experiments were "complete befooling," as the results were, he considered, unsatisfactory and contradictory.

In the course of his paper Mr. Cramb gave the results of some experiments as follows:—

	Grains of Silver per ounce as shown by	
	Hydrometer Tester	Analytical Test
Collodion bath from Mr. John Urie	29	29
" " Mr. A. Macnab	31	34
" " Mr. J. Bowman	33	25
" " Cramb Brothers, No. 1	26	28
" " " No. 2	31	33
Albumenized paper printing bath from Mr. J. Stuart ...	96	84
" " " Mr. A. Robertson	68	63
" " " Mr. H. M'Farlane	105	88
" " " Mr. D. Brown ...	100	94
Very old ditto from Cramb Brothers	56	31
Special test baths, from Cramb Brothers—		
A new bath for printing, made to 90 grains, 8 ounces of solution, used one day, and reduced to 4½ ounces of solution	70	62
The same bath, again made up to 90 grs., 8 ounces of solution, used one day, and reduced to 3 ounces of solution	62	45
The same, again made up to 90 grains, 8 ounces of solution, used one day, and reduced to 4 ounces of solution ...	66	48
A new 60-grain printing bath, 8 ounces of solution, used one day, and reduced to 4½ ounces of solution	41	32
The same bath, made up to 60 grains, 8 ounces of solution, used one day, and reduced to 5 ounces of solution ...	56	44

At the conclusion of the paper Mr. James Cramb performed some of the experiments in the presence of the meeting. After which a conversational discussion ensued on the use of the hydrometer; the unfortunate instrument being alternately denounced as a toy and a cheat. After some votes of thanks the meeting was adjourned to the following week, when the discussion and experiments were to be resumed.

Photographic Notes and Queries.

EXPOSURE FOR DRY PLATES.

SIR,—I have several times been on the point of addressing you upon a subject which has a good deal embarrassed me. I allude to the marvellously short exposures recommended, both orally and by "the books," for plates prepared by the dry process. Five, ten, and thirty seconds have been prescribed, while I, and many like me, using the best materials, are compelled to give as many minutes. Some time back (in concert with a clerical friend who was equally puzzled) I contrived a plan which we thought would afford a fair test of the value of various exposures. We arranged our camera so that about three-quarters of an inch of the plate was exposed each time, thus reproducing the picture at short intervals on its whole length. We commenced with half a minute—going "minutely" to work—though considering a little excess of exposure a matter of slight moment, we thought that a little more or less was of secondary importance. We increased half-a-minute—a minute, two, four, up to fifteen, and, *cæteris paribus*, we decided that four and a half minutes' exposure gave the best picture. In this opinion we were confirmed by the authority of professional men who saw the print. I should add that this was taken with a Jamin quarter-plate lens, stopped to about half an inch, and in sunshine.

I have noticed, at the present Exhibition, a frame of Fothergill prints, in which the mode of manipulation is given; and among other information we are told that the time of exposure was from *five* to *ten seconds.* I would make the remark with all humility; but if the author wished to impress us with the total inadequacy of a short exposure, he has, to my mind, entirely succeeded. I beg to enclose two prints, taken by the Fothergill process in the fall of last year. To the one (the oak) I gave fifteen minutes; to the other (the ash) I gave half an hour's exposure. The day was bright in the one case—somewhat lowering in the other. The defect which your critical eye will readily detect in the latter arose from a blunder in placing the film side upon the holder before developing. I send the prints to you as they came, like Venus, from the "bath," and like her, without any adornment beyond that "laid by the cunning hand of nature only." There is no manipulating of the skies, nor any of those "aids to development" common among the professors of the art. I am aware that my prints are a long way off perfection; I am also aware that comparisons are odious; but I hope you won't accuse me of vanity, if I ask you whether they might not be placed in juxtaposition to those I have referred to, and not be greatly injured by the operation.

If you think so, I shall be encouraged to persevere in the course I have adopted, and when my short-exposing friends proffer their advice, to give them what their system has never given me, a decided "negative." I am, sir, your obedient servant, H. T. T.

5, *February*, 1861.

[The common fault of most dry plate negatives is under-exposure. These produce hard pictures, with snowy, patchy lights, and photographers are then led to regret that it is the tendency of dry plates to give these results. We believe it is simply the tendency of photographers to under-expose and over-develop, and that with proper treatment the results may frequently equal wet collodion. Witness the specimens of Mudd, Lyte, Wardley, Bourne, and others in the present Exhibition. Your specimens are very respectable, and infinitely better than if they had been exposed a shorter time.—ED.]

SOLAR THEORY.

London, Feb. 19th, 1861.

DEAR SIR,—Having read, with great interest, the accounts in the PHOTOGRAPHIC NEWS, given by the various observers, concerning the phenomena connected with the late Solar Eclipse, with your kind permission I will endeavour to give my ideas concerning the protuberances and roseate matter seen on the sun's surface.

It is known that the light received by us from the sun does not include rays of every degree of refrangibility, but that the solar spectrum, as seen through a telescope, is crossed by nearly 600 dark lines, indicating the absence of certain rays.

Sir D. Brewster discovered that artificial light, which commonly contains no such lines, by passing through a small thickness of nitrous acid, is made to exhibit them; and it is a curious fact, that the nitrous acid absorbs exactly those rays of definite refrangibilities which are missing in sunlight, and the sunlight being passed through nitrous acid, the lines become wider until they run into one another, therefore NO_3, of a certain thickness, will (I presume) absorb all the rays of every degree of refrangibility.

It is proved that the sun is covered to the height of 8″ or 10″ with a roseate matter. Now, sir, might not that matter and the protuberances be composed of NO_3?

I have not the chemical knowledge to be able to say whether NO_3 would be decomposed into its elements O and N by the intense heat at the surface of the sun, or whether a mixture the same as atmospheric air may be made to combine to form nitrous acid from the same cause; that I leave for persons abler than myself to decide.

The sun and earth (according to the nebular hypothesis put forth by Laplace) was formed by condensation, is it not possible that N and O may exist on the sun's surface as well as on the earth?

Might not the so-called temporary stars arise from their being surrounded to a great thickness by the same matter, and their bursting forth in the manner they do be caused by their being seen through openings in the mass of cloud, caused by some disturbance from beneath the surface; and the sudden disappearance of some from the heavens, I think, may be accounted for by the supposition that large masses of nitrous vapour revolving round the star as a planet, and interposing between us and the luminary, it may be years before it would have passed the star so as to allow it to become visible again; its volume may be many times larger than the star, and travel comparatively slow. Hoping that I have not occupied too much of your valuable time, I remain yours respectfully,

CHARLES G. SHONE.

P.S. Perhaps some of your correspondents would favour me with their ideas upon the subject.—C. G. S.

WARMING THE STUDIO.

DEAR SIR.—I wish to devise some economical means of heating my studio and operating room, a heat of 60° at the least, being required in the latter. The length is 24 ft.×9 ft. Could some of your readers assist me in this matter? Yours &c. TYRO.

P.S.—The room is built of wood covered with felt.

ALBUMENIZED PAPER AND ALKALINE TONING.

SIR,—It is with considerable interest and satisfaction I weekly peruse my NEWS; but I must confess myself somewhat surprised at the difficulties which some of your correspondents appear to encounter with respect to albumenized paper and alkaline toning. Herewith are two pictures taken at random from yesterday's batch:—Silver bath, 60 grains; float, 3 minutes; after printing, wash well; tone in gold, 2 grains; water, 1 pint (slightly warmed), and carbonate of soda, 4 grains; fix in saturated solution of hypo. I have a juvenile to excite my paper, and, under my superintendence, to tone and fix. The paper I use and prefer is that of a Hammersmith maker, advertised in your journal.

I should state, *par parentheses*, the above solution tones two whole sheets of paper. And now for "the causes of failure:"—this appears to me to reduce itself to two small proportions; firstly, *allowing the silver bath to become weak;* secondly, *a too liberal use of carbonate of soda.* I do think, sir, if some of your correspondents were to try my plan, *especially attending to the silver bath*, the paper, and the soda, as *perhaps* a secondary consideration, they will no further have cause to complain.

Enclosing my card for your satisfaction, I am, sir, yours obediently, PHOS.

[The prints enclosed are perfectly satisfactory. Personally our experience confirms that of our Correspondent.—ED.]

Talk in the Studio.

Royal Portraits.—Mr. Mayall had been engaged during the last few days, at Buckingham Palace, in taking a new series of photographic portraits of the Queen and Royal family. The series published last summer acquired a popularity so great, that for some time past the negatives have been inadequate to the production of more than a percentage upon the demand. This had led to the issue of pirated copies of the originals, which are at once libels upon the art, the artist, and the royal originals. This piracy is an evil of the most irritating nature to the first-class photographer, as he is, by it, not only injured in purse, but in reputation, by the spurious copies being regarded as his work. We regret to say it is a species of dishonesty that some respectable houses have not hesitated to adopt. We noticed, the other day, in passing the establishment of a respectable house, and one, which, if we mistake not, has made heavy complaints of the piracies of photographs issued by it, a whole series of card portraits which, from the want of sharpness, and the peculiar texture or grain which pervaded the prints, bore unmistakable traces of being copies. In regard to the royal portraits, in the face of it being impossible to meet the supply at a legitimate price, we have heard that they have been offered to "the trade" as low as three shillings a dozen, a price which would at once indicate their quality and origin. Mr. Mayall has, we understand, notwithstanding the imperfection of the copyright law, been able to adopt, in regard to the series now in preparation, a plan which will enable him at once to detect and punish piracy.

South London Photographic Society.—The usual monthly meeting of this society was held in St. Peter's School Room, Walworth Road. The subjects which were to occupy attention consisted in the resumption of adjourned discussion on Celestial and Meteorological Photography; the continuation of the Report of the Experimental Committee (see p. 90); and a Paper on Photography on Wood, by Mr. Contenci. A report of the proceedings will appear in our next.

New Photographic Periodical.—We observe that a new French Photographic journal is announced to appear fortnightly, under the joint-editorship of M. Lacan and Herr Liesegang, our esteemed German correspondent. The title of the new aspirant for the suffrages of the reading photographic public is, *Le Moniteur de la Photographie: Revue internationale et universelle des Progress de la Photographie.*"

Architectural Photographic Society.—A lecture was delivered at the society's rooms, on Tuesday evening, on the Collection of Indian Photographs, by James Fergusson, Esq., F.R.A.S. The lecture consisted of an interesting explanation of the peculiarities and beauties of the Indian Architecture, its immense importance as a historic record, and the value of photographs as affording persons in this country efficient means of studying and systematizing such records. He urged the importance of procuring complete and systematic series of photographs of all the important palatial and ecclesiastical architecture of the Indian empire. An incidental remark on one of the pictures exhibited struck us as important. Referring to the photograph of a fine temple, he remarked, that unfortunately it conveyed no idea of the building, which was really of white marble, and most brilliant in effect; whilst the photograph was somewhat dark and dingy: he presumed it might be due to the non-actinic yellow tinge which the marble might have acquired. On examining the picture at the close of the lecture, we found that, although this circumstance might have had its effect, and under-exposure a little more effect, the chief cause of the dingy appearance which characterized the building was due to a stopped-out sky, which, by presenting a glaring mass of white paper, killed and degraded the tone of the building beneath in a most injurious degree, and thus destroyed its true character.

Popular Science.—We met with an amusing instance the other evening of the various methods of illustrating science for the million. In the street near the National Gallery was placed a table neatly arranged, round the edge of which was placed alternately a stereoscope with slides, and a microscope with objects, for the inspection at one penny per head, of the intelligent *gamins* of London.

Advertisements and Communications for the Publisher for the current number, to be addressed to the Office, 32 Paternoster Row, not later than 3 o'clock every Thursday. Post-Office Orders are to be made payable to Mr. Thomas Piper, at the Money-Order Office, St. Martin's-le-Grand.

To Correspondents.

G. H., Boulogne-sur-Mer.—Soluble cotton, made after Mr. Hardwich's formula, can most likely be procured from Messrs. Burfield and Rouch, who now carry these formulæ into effect commercially. The articles on the subject, containing the proportions, &c., you will find in the third volume of the Photographic News. You will find about five or six grains of cotton to half an ounce of ether and half an ounce of alcohol, with two grains of iodide of potassium, two grains of iodide of cadmium, and one grain of bromide of cadmium give a good collodion for most dry processes.

Oxygen.—We fear the method referred to will not be applicable in small quantities. We will give details in a future number.

W. Hooper.—The account in our pages is the fullest yet published. A detailed description will appear in the Transactions of the Royal Scottish Society of Arts; but it is uncertain when, as they are published at rare intervals. A letter to Mr. Hart, at the address given, would be the best means of obtaining fuller information. The descriptions of Ruhmkorff's coil are to be found in various articles scattered through the pages of the *Philosophical Magazine* during the last two years.

Simon Slow Coach.—The mottled effect you describe is frequently the result of a cadmium collodion from which much of the ether has evaporated. It may also result from too rapid immersion of the plate in the bath. 2. The paper referred to is not yet published. It will appear in our pages in due course if found sufficiently important. You will find sufficient information on the subject in the Photographic News Almanac.

An Aspirant.—The writer of the advertisement is doubtless somewhat confused in his phraseology. He probably means colouring positives on glass and on paper with powder colours. Nevertheless, the use of an orange powder colour to give intensity to points of light in weak negatives is sometimes resorted to.

R. G.—The application of a joiner's square to the uprights would enable you to ascertain with perfect accuracy; but the exercise of a little care is generally all that is necessary. In those manufactured by Mr. Meagher there is a gauge given, so as to ascertain at once with certainty. 2. The question of copyright is rather a difficult one. If you give away a photographic copy of a copyright engraving, that might possibly be construed into publication. If you give a copy in exchange, that really is equivalent to selling, as buying and selling are really merely convenient modes of exchange.

A. H.—We have made some enquiries regarding plano-convex condensing lenses, and cannot learn that they are usually kept for sale, as there is not at present much demand for them in this country. They may be procured to order by most photographic dealers. The price of a nine-inch lens of French make is about 30s. we believe. An English made one, of the best glass, would be much more expensive.

J. N.—No. 3. decidedly, as it possesses all the good qualities of all the others, and gives in addition perfect freedom from distortion. The back lens may be used, moreover, as a view lens alone. For a portable camera, Kinnear's, as lightest and most efficient.

O. X. X.—The convex side towards the ground-glass; place the stop at a distance in front equal to about the diameter of the lens. Blacken the edges of the lens before placing it in the mount. There should be several stops of different sizes, from ⅛th of an inch to ½ an inch. ⅜ths is a good size if you have only one. The collodion you mention is not favourable to density, although excellent for detail. Mix with it part of a collodion giving great density.

C. F. B.—See article in the present number, and in Nos. 106, 109, 110, and others. You will find some instructions for colouring magic lantern slides in page 287, vol. i, Photographic News.

W. G. G.—There is no necessity to keep the nitrate of potash solution, and the sulphate of iron solution in two separate solutions, nor is there any earthly advantage in doing so, as they keep just as well mixed; nor will it make any difference with which you mix the acid and alcohol except that the iron solution will not keep well without the acid. Spread the chloride of calcium on a plate, and dry over a water-bath; or if that is not convenient, in an oven.

Tyro.—In Maxwell Lyte's formula for the gold bath the chloride of gold is supposed to be neutral to begin with, before adding the phosphate of soda. The stock solution should always be neutralized at the outset with as small a portion of carbonate of soda as will suffice for the purpose. The use of Maxwell Lyte's or "Theta's" formula is quite a matter of taste; both will give excellent results if fairly used. The disadvantage of carbonate of soda in any excess is its tendency to cause blisters in some papers. Mr. Woodward's pictures are specimens of excellent printing, see his advertisement. We shall be glad to see the specimens and the design you name. Your letter in our next.

N.—The specimen you enclose, which by the way, got provokingly torn in the post, is simply a very good print from an exquisite negative, making a very charming little picture. The circumstances of its printing are somewhat surprising, and would indicate that the negative must be a very vigorous one. We do not remember the article you mention, and cannot at this moment refer to it; but the subject is worthy of consideration. The same effect can doubtless often be produced by different means, but the question to decide is, which is the best and most certain; and that we think is found in the method usually recommended. See the letter of our Parisian Correspondent in this number

Tripon.—We are not skilled in archæology, and cannot give you any idea of the date or value of the stone bottle. The streakiness may arise from the condition of the bath, which would be improved by a minute dose of nitric acid; or it may be from a dirty slide, or from a dirty plate. You may produce magic lantern slides either by camera-printing from the negative, or by superposition. You will find information on the subject in former volumes, and we shall have an article on the subject shortly. The terms for advertising in the Photographic News are to be seen on page iv. of the advertisements.

Justitia.—Will see on reflection, that we cannot publish his letter, notwithstanding the justness of many of his remarks, as it denies, by implication, a privelege to the highest person in the realm which is not denied to the lowest subject, namely the right to select an artist to be employed. Besides, as we have intimated in another column, there is no guarantee that the imperfect and fading prints have been executed by the artist named; it is more than probable they are some of them injurious and disgraceful piracies.

A Constant Subscriber and others in our next.

THE PHOTOGRAPHIC NEWS.

VOL. V. No. 130.—*March* 1, 1861.

PHOTOGRAPHY AND WOOD ENGRAVING.

It is a somewhat singular fact that, whilst any time during the last eight or ten years, discoveries have been constantly made whereby the problem of photographing on wood for the engraver has been solved, or stated to have been solved, each process proposed has remained, to all practical purposes, a complete dead letter. As early as 1854 to our recollection an engraving appeared in the *Art Journal*, photographed on wood and engraved by Mr. Langton of Manchester, who stated that he had then used the process for four years. By what method the photograph was effected, was not stated, but from some very sensible remarks on the conditions necessary, the use of a collodion film is suggested. The conditions are as follows:

1. The block must not be wetted, or it will cast, and the grain will open.
2. No material must be laid on the surface which will sink into the block and stain even the hundredth part of an inch below the surface, or else the engraver cannot see his cuts to any delicacy of detail.
3. Neither albumen, nor pitch, nor any brittle material, can be allowed upon the block, or else of course it will chip in the cross lines, or those close beside each other.
4. Whatever ground of any description is made use of must be so impalpably thin as to be really tantamount to the surface of the block itself, or else it cannot be equally cut through to any degree of certainty.
5. The block should be so prepared for the purpose of the photographer, that his collodion or other preparation may freely flow over it without sinking in, and that it may be easily cleared off in case of any failure in a first attempt, in order that another photograph may be put upon the same block without fresh dressing.
6. The positive must be either a *positive* upon a white ground, (or, the unaltered wood itself) or a *negative* upon a blackened surface.

Various attempts at intervals followed, and in the beginning of the year 1858 a process was patented by Mr. Newton, in which many of the conditions, particularly the saturation of the wood with varnish, appear similar to those detailed by Mr. Contençin in another column. During the same year an article appeared in the *Art Journal*, from the pen of Mr. Robert Hunt, in which similar conditions are again stated, and the thing as *un fait accompli* again announced.

Now, as the advantages of photographing direct on wood, so as to prepare the block for the engraver without the intervention of the draughtsman, must be obvious to every one, it is clear that some cogent reasons, or unstated difficulties have existed to prevent the thing coming into general use. These reasons, we apprehend, may be resolved into three classes; the *vis inertia* of the engravers, or the opposition of draughtsmen; the difficulty of rendering the various tones of the photograph by the conventional lines of the engraver; or, some inherent difficulty or unsuitableness in most of the methods proposed for producing the photograph on the surface of the block.

Regarding the first of these difficulties we apprehend that the enterprise of publishers would soon find means to overcome it, if the other obstacles ceased to exist. The second is more serious: it might be met, however, in the first place, by confining the work to the hands of the few capable engravers who can undertake such work, and in the next, by following out a suggestion by Mr. Hunt in the article referred to, namely, the education of a class of engravers who should be taught to work directly from the photograph, translating its tones into the various effects possible in wood engraving. The third difficulty is manifestly overcome in the process of Mr. Bolton, in which the block appears quite free from any film of any kind, collodion, gelatine, albumen, or varnish. Mr. Bolton having spent much time upon working out his process and being an engraver by profession, is naturally indisposed to give away that, the beneficial use of which the can retain to himself in the exercise of his vocation. As, however, that which is beneficial to the individual in such cases, rarely tends to the advancement of the art, or to the advantage of the public, we propose briefly to call attention to a process to which, so far as we have had opportunity of observing, Mr. Bolton's very nearly approximates.

The process we refer to is that proposed by Mr. Crookes in 1858, and which seemed to have been singularly overlooked, perhaps the liberality with which it was given to the public having really tended to produce that effect. In that process, we believe all the conditions desirable are strictly fulfilled: the cohesion and texture of the wood are not in any degree affected, there is no film to interfere with the operation of the graver, or to become disintegrated in fine cross cuttings; the wood is not blackened below the surface; in short, the block is in all respects in the same state as when prepared by the draughtsman, the only conditions enforced on the engraver being his capability of translating tone into line, and that the block be cut in a subdued or artificial light.

The process, which will be found in detail in our first volume, p. 193, is very simple, and consists in rubbing over the surface of the block a little oxalate of silver moistened with water. The block is then exposed under a negative to direct sunlight, and a print is obtained in the usual manner. No fixing is required, darkening only taking place very slowly, ordinary diffused daylight having but little action on the coating of oxalate of silver.

In all cases of this kind, it is of little purpose to say that such and such processes "probably might answer." It is the fact of having been successfully practised which gives value to the formulæ. The process of Mr. Contençin has, we understand, been practically tested, and considerable interest would have been added to his paper the other evening if he could have shown some specimens of the results. Mr. Bolton's process has been eminently successful, as the engravings in the *Lyra Germanica* attest. But in no instance can a more completely practical and satisfactory illustration be given, than is found in the engraving of the "stereomonoscope" given on page 26 of our first volume, the block for which was photographed by his own process by Mr. Crookes, and engraved by Mr. Pearson, of Bolt Court.

PHOTOGRAPHIC CHEMICALS:

THEIR MANUFACTURE, ADULTERATIONS, AND ANALYSIS.

Next in importance to nitrate of silver stand *iodine* and the various *iodides*. Iodine, as being the body from which the various metallic iodides are prepared, will be described first, although for various reasons we shall not devote so much space to it as we did to nitrate of silver.

Iodine, from the Greek τὸ ἴον, the violet, owing to the exquisitely beautiful colour of its vapour, is found principally in combination with magnesium, sodium, or calcium, in various mineral springs and in sea-water. It is obtained in commerce almost entirely from the latter source, although from the very small quantity present in sea-water (so small that many skilful chemists have altogether failed to discover it), it is necessary for it to undergo a process of concentration by passing through the organisms of certain marine and littoral plants, which have the property of absorbing the iodine from the sea-water when it is found in combination with bases in their ash. From this is prepared as follows:—Varec or kelp, the ashes of various species of marine plants, is placed in water, and then boiled for some time until the soluble salts are all extracted. The liquid is then evaporated to a small bulk, and after filtering off the crystals of salt, &c., the filtrate is evaporated to dryness, mixed with peroxide of manganese, and heated to commencing redness. It is then again dissolved in water, and the iodine precipitated from the solution by means of chlorine. The crude iodine obtained by the preceding process is purified by washing with water, drying, and subliming. The above is a brief outline of the method employed for the extraction of the iodine. We have purposely made it brief, as it is not likely that many of our correspondents will care about preparing this body for themselves. The account could not however have been altogether omitted, as it is necessary to have an idea of the source and mode of preparation, in order to understand its subsequent history. We will suppose that the operator is already in possession of commercial iodine. This will generally be too impure for photographic uses, and it will accordingly be necessary for him to purify it. This may be done in the following manner:—Take a Florence oil flask, and clean it perfectly by boiling a strong solution of soda in it once or twice, finishing off by boiling a strong solution of cyanide of potassium, and well rinsing with water. When quite clean and free from smell of oil, place in it the iodine which is to be purified (one ounce we will suppose) and pour over it about four ounces of strong spirits of wine. Let the two digest together for about half an hour at a gentle heat; at the end of that time the iodine will most likely have dissolved, if not, boil the liquid for five minutes over a gas flame or spirit lamp, and allow it to cool. Whilst it is cooling, place a filter paper and funnel in the neck of a perfectly clean quart bottle, and then pour the alcoholic tincture into the funnel. A clear, dark brown solution of iodine in alcohol will come through into the bottle, and the impurities will be left on the paper; any intentional adulteration with black lead or similar body will in this way be detected. When the whole of the solution has passed through the filter into the bottle, pour into the latter, in a thin stream with constant shaking, pure distilled water, until the bottle is three quarters full; shake it violently for a few minutes, and then set it on one side. In an hour or two, upon examination, it will be seen that the iodine has separated from the liquid and settled at the bottom, in the form of a dark grey, almost black powder, a brownish transparent liquid floating above. This may now be poured off, and the iodine at the bottom of the bottle collected on filtering paper, and allowed to dry at the ordinary temperature of the air in a place free from dust. It must then be kept in a well-stoppered bottle. It may also be purified by sublimation; for this purpose it is to be placed in a glass retort, and heat applied until it rises in vapour, and recondenses in the neck and receiver in the form of crystals. The process of solution and precipitation is, however, easier for amateurs to perform, and although it involves the expense of the alcohol, we think that it is the one which would be preferred on the small scale.

Iodine when purified is of a blackish grey colour with metallic lustre, resembling black lead or micaceous iron ore; it is very soft and friable, and is easily reduced to powder. It crystallizes easily by sublimation, or from solution, forming right prismatic crystals. It transmits light only when in very thin pieces, the transmitted light appearing red. It fuses at 224·5° F., and boils between 347° and 356° F., being converted into a magnificent violet vapour, which is so dark as to be quite opaque when in a stratum of four inches thick. Its specific gravity in the solid state is 4·948. It has a peculiar odour when faint, reminding one of the sea, but when strong being more like chlorine. Its taste is sharp and astringent, and taken internally it acts as a powerful poison. It communicates a transient brown colour to skin and other organic matter. The most delicate test for the presence of iodine is the bright blue colour which it produces when brought in contact with starch paste, the smallest appreciable quantity of iodine being able to be detected by this reagent. Iodine is very slightly soluble in water, one part of the former requiring no less than 7000 parts of the latter for its solution, according to Gay Lussac.

For the preparation of the metallic iodides several methods are employed, according to the metal with which it is desired to obtain the iodine in combination. Several of these compounds are made from iodide of iron, and we propose, therefore, to describe the preparation of this body first, and then to give the modes of making the other iodides from it. In a Florence oil flask, which has been cleaned as above directed, place gradually 2 parts of iodine in a mixture of 1 part of clean iron filings and 10 parts of water. Warm them with frequent shaking, and when the combination is complete, which may be known by the solution becoming colourless or very pale green, filter it into another clean flask. It will now be a solution of proto-iodide of iron, from which may be prepared iodide of potassium, ammonium, &c.

If it be desired to prepare iodide of potassium, add to the above solution, having been previously heated to the boiling point, a solution of caustic potash in small quantities, until there is no longer formation of a dark precipitate, and the solution is very faintly alkaline. Then filter into a china cup, and evaporate to dryness in the manner recommended when we were treating of the preparation of nitrate of silver. When dry, it should be extracted with six times its weight of strong alcohol at a boiling temperature, having been previously well powdered. The filtered solution, after the alcohol is evaporated or distilled off, leaves iodide of potassium, which may be crystallized in the following manner. Dissolve it in its own weight of distilled water, and filter if necessary, then place it in a shallow vessel, on a water bath, covered over with a piece of dry filtering paper, so that it can evaporate without any dust falling in; when about half the water has gone off, remove the source of heat from the bath, and allow it to cool gradually. White cubical crystals will be formed at the bottom of the vessel on cooling, which must be removed by pouring off the mother liquor and draining on a funnel, when dry they will be pure iodide of potassium, and must be preserved in a well stoppered bottle. The mother liquor will yield a further crop on re-evaporation, which will not, however, be quite so pure.

Critical Notices.

STEREOGRAPHS OF ENGLISH SCENERY. By W. Woodward, Nottingham.

We have received from Mr. Woodward a packet of his exquisite stereographs of English Scenery, consisting of views of Fountain's Abbey, Tintern Abbey, Rievaulx Abbey, Bolton Abbey, Easby Abbey, Helmsley Castle, Raglan Castle, Chepstow Castle, and Lichfield Cathedral. There are between two and three dozen subjects, which Mr. Woodward explains comprise all he was able to get during the late unfavourable summer. The wonder is that anything at all was obtained, and still more that anything so excellent as the majority of the photographs before us, which are uniformly specimens of first-class photography.

The first that enforce our attention and interest are the series of Tintern Abbey. This fine ruin has so often been done, both by the painter and the photographer, that one might well have become sated with it, and regard it used up, especially after Bedford's noble pictures; but we examine these stereographs with unabated, or rather with fresh interest. Mr. Woodward has gone about his work with an artist's feeling, and his selection of point of view and general treatment has added, in many instances, a new charm to that which was already beautiful. We especially commend attention to No. 210, "Tintern Abbey from the South East." In this slide, unlike too many photographic views, the object has not been to fill the picture with the building itself, but to compose a picture of which the abbey forms part. For vigour, gradation, arrangement, breadth, and general pictorial effect, this is a decided gem.

The Fountain's Abbey series, consisting of eight views, are in no wise inferior to those of Tintern, and are not the less full of interest because very familiar. The especial charm here again is the selection of point of view. No. 201, "Bridge over the River Skell," is an exquisite slide, in which the transparent water of the babbling brook reflects the dark overhanging foliage, and with the rustic bridge and ivy-clad building combines to form a charming picture. No. 122, "The Bridge leading to the Eleemosynary," is another view to which we commend attention.

The whole of the Raglan Castle series are fine pictures; No. 226, "A View from the Walls," especially pleases us. We have not space, however, to enter into detail as to the merits of each picture worthy of notice. The series throughout are good specimens of photography, and are, with the exception of the white skies in some—not all—possessed of much pictorial excellence.

The negatives are produced by the collodio-albumen process, and illustrate as do Mr. Mudd's and others in the present Exhibition, that there is no necessity for such negatives to be hard and chalky.

One point strikes us especially: the uniformity of the printing, and the rich warm tone which prevails. No higher testimony is needed to the value of the alkaline gold-toning process—which Mr. Woodward, unlike many professional printers, adopts—than these pictures, in which neither meeliness, flatness, slatyness, or any of the manifold sins with which this process has been charged, are here at all apparent. Permanency is here obtained without any sacrifice, but with an accession of beauty.

LETTS' EXTRACT BOOK, prepared for the reception of Various Scraps from Various Sources. London: Letts and Son.

The especial claim which this volume has upon our notice is its suitability as a reception for photographs. It consists of a handsome quarto volume of superfine paper, part of which is manufactured guard-book fashion. To this is added a portion of ruled paper for descriptive manuscript, and another portion lettered for index. The whole is neatly bound in cloth, and supplied with a packet of gummed wafers contained in a pocket in the book. Altogether this will form a valuable photographic scrap-book, and its possession an inducement to the systematic preservation and annotating of photographs.

A LIST OF PHOTOGRAPHIC APPARATUS AND MATERIALS; to which is added Ample Directions for Use, and Instruction for Amateurs. By Thomas Greenish.

This is work combines the novel features of a tradesman's catalogue, and a complete instruction book. The former does not come under our province to notice, but we may remark of the instructions that they appear as simple, clear, and efficient as possibly can be supplied within the limits to which they are necessarily confined.

A MANUAL of PHOTOGRAPHIC CHEMISTRY. By T. Frederick Hardwich. Sixth Edition. London: Churchill.

We have only space to notice briefly that Mr. Hardwich's sixth edition of his valuable Manual is now ready, and that it contains much new and important matter. We shall, in another number, notice the new features in detail.

THE PRACTICAL DETAILS OF THE FOTHERGILL PROCESS.

BY F. HOWARD.*

I feel that some apology is due to you on my part for venturing to engage your time about a subject of which so much has been said and written, namely, the Fothergill dry collodion process. However, having been requested by your committee to lay before the members my process of working, I have ventured to do so, nothing more pressing being before the society. In the first place I desire to intimate to you that what I have to say is pre-eminently practical, and nothing will be brought forward or asserted in this paper that I have not tested and proved myself; and at the same time I would say that my remarks are more addressed to those gentlemen who would desire to produce pictures, than to those who are more inclined to experiment or draw comparisons.

The bath I use is the ordinary negative bath of not less than thirty-five grains to the ounce, and not more than forty, carefully filtered, possessing faint acidity, and tested with a wet plate before commencing to prepare dry ones. The glass I use is the best polished flatted crown, which possesses as fine a face as patent plate, and, after rejecting all curved and thin pieces, is much cheaper and less weighty. The albumen I prepare by obtaining the white of one egg—(which you will obtain best and most free from germ by making two moderate-sized holes, and blowing the egg, after the fashion of boys of bird's-nesting experience), to this I add three parts of water, common or distilled, a little more or less does not matter, beat it well with a silver or wooden fork, or place in a bottle and well agitate till it is all froth. I prefer the bottle, as it is less messy, does not require pouring from one vessel to another, as you can see at once if it has mixed properly; as it will frequently happen, even with distilled water, that the albumen coagulates, and the mixture is full of white opaque flakes, and when rubbed between the fingers is not tackey, and does not possess the gummy feeling which dilute albumen ought to have; this must be thrown away, and a fresh lot mixed. It will generally be found that the clear white of an egg is very nearly one ounce in measure, you will therefore have four ounces of dilute albumen, which will prepare three dozen stereoscopic plates; if you now add some 60 to 100 drops of strong liquor ammonia, and well agitate, you will find the mixture much clearer, and if left for a few hours is very transparent.

The collodion is the most important item of the process; pictures may be obtained with any good collodion, but the plates will have all the characteristics, except sensitiveness, of the collodion, and in an exaggerated degree; for instance, the collodion which gives dense negatives used wet, will give denser if used dry, the long development will tend much to assist density; the collodion possessing half tones will be liable to stains and marks, and will generally lack density. The skies printing through, and a difficulty of avoiding stains, is a very strong feature.

I have, during last summer, tried a great many descriptions of collodion, and those possessing an abundance of half tones have invariably shown stains in drying, quite apparent before development; always occurring in the same place, namely, the upper half of the plate; when drying, I have watched them appearing, they being quite apparent if the plate is held so that the light falls obliquely on it. I can only account for this by imagining that the washings have a disturbing effect upon the sensitive film, and tend to separate and cause a crystallization of the iodides

* Read at the Meeting of the South London Photographic Society, on the evening of Thursday, Feb. 21.

or bromides in the collodion. To prevent these markings I have employed, with some success, the following mixed collodion:—three parts of a collodion giving half tone, to one of a dense collodion, both having been iodized some days, this gives a creamy, powdery film, which is very desirable, and indeed necessary to success.

I will now proceed to describe my method of manipulation. Having the bath ready, and the plates cleaned a few hours before, I take a clean plate and lay it between two pieces of clean blotting-paper, and place upon the top a flat bottle filled with hot water, in the mean time get the collodion bottte, free the neck from dry pieces of collodion, and get the plate-holder, slightly damping the edge of the india-rubber; remove the plate, brush both sides with a broad camel-hair brush, and, being sure that the glass is not too warm, attach it to the plate-holder, coat with collodion, allow it to set, and immerse in the bath. I then take a clean funnel, and push with a porcupine quill a clean piece of sponge into the neck (not too tight) and filter into a clean measure the dilute albumen, whilst filtering I move the plate up and down in the bath, (perhaps it is as well to commence filtering the albumen an hour or so before, as it is a tedious operation). I now take a clean dish, a little larger than the stereoscopic plate, and pour into it about three ounces of filtered rain, distilled, or filtered common water, which has been boiled, and, having removed the plate, drained and wiped the back, place it in the dish—I then hold it on a level with the eye between me and the light, and incline it at an angle sufficient to cause the water to flow completely over the plate to the other end of the dish, then back again, until all greasiness has disappeared, *and one turn more*, remove the plate and stand to drain on a clean pad of blotting paper (meanwhile get another plate and place under the hot water bottle), then attach the sensitized plate, after wiping the back, to another plate-holder, and pour along one edge enough filtered albumen to flow evenly across the plate, then let the surplus fall off the other side, put the lip of the measure to the edge of the plate, and carry the albumen round the edge; flow the albumen still on across and across the plate three or four times, then drain off, and place the plate in another dish of water, enough to cover it; having done so, dip your fingers into a basin of clean water and wipe them, remove the second plate from under the bottle, and coat that with collodion and place it in the bath. Now take the dish of water containing the first plate and agitate so as to cause the water to flow across the plate, some thirty times, throw out that water, and fill again, not allowing the water to fall on the plate from the vessel; again agitate as before, throw away, and a third time fill the dish with water and agitate, then remove the plate, stand on blotting paper, and wipe the back, then remove and place in a cupboard or box, free from dust or light, to dry spontaneously; standing it so that it rests on the corners, thus the right hand top corner on a clean piece of blotting paper, the left hand bottom corner against the wall, or side of the box—your other plate will, after moving up and down in the bath, be ready for the same treatment; by pursuing this method of washing, you obtain a perfectly even sensitive film far more easy than by confining the amount of water to four or six drachms, and much less liable to stains or insensitive patches as will be obtained if you wash under a tap.

Plates thus prepared I have kept for a month, they possess a high degree of sensitiveness; I have obtained good negatives in forty to sixty seconds of well-lighted subjects. Drying by artificial heat I do not approve of, it has never given satisfactory results in my hands, indeed I believe that it is to the power of albumen, gums, gelatine, and sugar to retain an impalpable moisture, that apparent dry plate photography is successful, and if you drive the moisture off by artificial heat you decrease the sensitiveness. This is a matter which I venture to call our Experimental Committee's attention to. The plate may advantageously be varnished round the edges, or albumenized with a camel-hair brush, it prevents the film slipping off in washing after developing.

The development I perform with pyro 2 grains, citric acid ½ grain to the ounce of water, silver solution, fresh filtered, of 10 grains to the ounce. Iron developers I have never tried.

I do not pretend for one moment that this method is superior to any other; I can only say it has answered in my hands perfectly well, and I regret that I have not more specimens to place before you; but if any gentleman desires, during the forthcoming summer, to bring back the reminiscence of a trip into the country, or any object of interest, I should be glad to hear he had given this method a trial, as I have little doubt of his success and consequent satisfaction.

A few words upon development may not be out of place, as more plates are spoilt during development than in any other method. Moisten the film all over evenly and rapidly; the best method is by immersion in distilled or filtered rain-water, have ready sufficient developer in a clean measure to cover the plate, remove the plate from the dish, and rapidly attach it to a plate-holder, keep the moisture well up to the edges, *they are apt to repel the moisture*, and the touch of the finger at the edge or back of the plate driving the moisture rapidly away, the consequence of which is that the developer will not pass over those parts; cover the plate well with developer without silver, on and off two or three times, then add, say, two drops of silver solution *fresh filtered*, to the drachm of pyro solution, well mix; again apply the developer, and if properly exposed the picture will soon appear; at the least sign of turbidness you must throw away the developer and mix fresh, washing out the measure; a peculiar characteristic of a good plate is that the developer does not darken, one allowance developing completely. If the lights are increasing in density too rapidly you may sometimes advantageously wash the plate and commence developing again; but it rarely succeeds. It is very useful sometimes when sufficient density is obtained generally—except the sky, or foreground—to wash, and then confine the further development to those parts requiring it. In conclusion, I shall be most happy if, during our ensuing meetings out-of-doors, I may hear some member say, "I am trying your plan of working Fothergill's process, just tell me how long you would expose for this view?" I shall then think these observations have not been superfluous.

I will, at the risk of reiteration, state what are the characteristics of good materials and successful results. The albumen absolutely bright and clear; the sensitized collodion film creamy to look at, powdery to the touch, and the negative should, when developed, show considerable transparency in the sky, indeed a dense sky is not to be obtained in a properly exposed plate, unless very much over-developed, this, by the way, need give little trouble to anxious workers as white skies are, I believe, out of date and much found fault with by our friends the artist photographers.

Traces of clouds may be frequently observed in dry plates, and if not obliterated by over-development add much charm and softness to the prints.

One word I would add as to the relative sensitiveness of wet plates and plates prepared by this method. I would say that they require from five to six times the length of exposure, never less; but there are many difficulties in the way of arriving at correct conclusions, as I have found that a collodion which is very sensitive when wet is not correspondingly so when used dry.

PHOTOGRAPHY ON WOOD FOR ENGRAVING.

BY JAMES CONTENÇIN.*

A method at the same time facile and practical for producing photographs upon wood for the purpose of wood engraving,

* Read at the meeting of the South London Photographic Society on Thursday evening, February 21, 1861.

has long been considered a desideratum, and has formed the subject of careful research, both in this country and on the Continent

At first sight this problem may not appear very difficult to solve; it would seem, at a mere casual glance, that wood might be treated much in the same manner as paper, or that a collodion film might be used, and the image developed upon it; but we must first consider the difficulties on the side of the photographic manipulator, and then the requirements of the wood engraver, and how they are to be met. Upon carefully considering these two points, and their relation to each other, it will not be difficult to see why so many methods have been cast aside as impracticable.

When a solution of nitrate of silver is applied to the surface of the wood-block, that surface readily darkens upon exposure to daylight. So far well; but we find that it is not only the surface which the solution has affected, but that it has also penetrated deeply into the substance of the wood, and softened it; thus making it far more difficult to cut.

The light substance of the wood, as seen in the cut lines, which is usually an indication of the extent of the engraver's work, is not in this case seen until the block is very deeply cut into.

But the most grave objection, to which I have already alluded, is the change to which the wood is subject. In the ordinary case it is crisp, and presents a certain amount of resistance to the graver. Of course, the block which has received the photograph ought to be equal in this particular to the common ones, but it will be found that the silver salt, and the soda used for fixing, by penetrating so deeply into the wood, have caused it to become in a manner soddened, very difficult to cut, and altogether objectionable.

The use of collodion has been to some extent successful; positives have been developed directly upon the block, the latter having first been coated with black varnish. I have seen a simple subject in process of cutting which had been prepared in this way, and succeeded very well.

Now, should this process answer as far as the preparation of the wood, and its substance being unaffected, which may be granted, yet its use must be limited, the wood engraver must not be expected to perform the work of the draughtsman, or to produce brilliancy, effect, and pictorial excellence from a metallic and sombre looking positive; he asks for a picture upon the block, which shall have all the qualities of the engraving which he is expected to produce, and those who have seen the admirable works of our talented artists in this department will very well understand the engraver's objection.

If photography is to be used, it follows that the photograph on the wood should be equal to a drawing such as that which the engraver would expect from the hands of the artist; it must be upon the surface only, the substance of the wood not being affected, the preparation must not scale or chip during manipulation, and the surface must not be affected by the light to which it must necessarily be exposed in the engraver's hands.

Having noticed briefly these methods, and the objections which are generally found to operate against their use, I shall now proceed to notice a process which I have not only been acquainted with for some time, but have used in practical work for several years.

The first thing which I found it necessary to guard against was the absorbent quality of the wood, and among the substances that appeared likely to correct this, such as gelatine, albumen, wax, aluminous soap, &c., I did not find any superior to the varnish made with gum dammar and benzole,—spirit varnish can be used, as also amber and chloroform varnish; but the benzole varnish is sufficient.

The method which I have used is this:—the surface of the wood is flooded with varnish twice or thrice, until it ceases to absorb the liquid, but no coating is allowed on the surface, the object is simply to saturate the fibre, this being effected, the block is placed aside to dry; I next proceed to coat the face with a white preparation, corresponding to that commonly used for drawing; for this purpose I have used washed chalk or whiting, but I think zinc white answers the purpose better; it is applied with a flat camel-hair brush, the excess being swept off.

When this is dry, the surface is again covered with varnish, and all not immediately absorbed is allowed to drain off, the wood being placed on edge; this last operation lowers the colour of the white coating, but it still remains sufficiently opaque to obscure the grain of the wood.

A solution of gelatine, containing twelve grains to the ounce of water, and twenty grains of chloride of sodium, is poured over the white preparation, and is allowed to drain off at the lower edge.

The block is rendered sensitive by being placed, face down, in a glass tray containing a solution of nitrate of silver, of seventy or eighty grains to the ounce, and kept carefully from contact by slips of glass; in this manner but a small quantity of sensitizing material is needful; a large quantity, by being repeatedly used, might become deteriorated by the white.

It is perhaps needless for me to go into minute details in regard to exposure, &c. I make use of the ordinary pressure frame, without the back, adjusting the block and negative in a way to allow of their being removed and replaced if necessary. I have occasionally placed the negative upon the block without using pressure, adjusting it by three pins, and this has answered very well.

In connection with the sensibility of the surface and the vigour of the image, I must observe that the quantity of gelatine or other organic matter is of the greatest importance. If too small in quantity, the image will not darken beyond a pale slate colour. In explanation, it must be recollected that the solutions being kept entirely upon the surface, and the silver not combining with or acting upon the wood, but only with the gelatine, there must be a sufficient quantity of that material, or of some other organic substance present; on the other hand a large quantity would render the preparation too thick.

This is the method which I have employed for producing photographs on wood blocks.

If performed in the manner I have just described, the coating as regards thickness of substance will be scarcely, if at all, perceptible under the graver; it is much lighter in colour than the wood itself, but not white; the markings of the grain of the wood may be traced through it, and there is no tendency to scale or chip away.

After exposure, the treatment of the image is throughout much the same as upon paper—it is fully toned in the gold bath and fixed in rather weak hyposulphate of soda, the action of the latter must be carefully watched, and a short washing in running water is sufficient.

The negatives taken for this operation should be moderately dense, not of the very intense kind, but with sufficient gradation. when taking them, the collodionized glass should be placed in the slide with the plain side towards the lens, otherwise the impressions from the block would be reversed.

In reference to recent claims for the successful application of photography to wood engraving, I may notice that the process I have used, and which I have just described, (slightly modified sometimes according to the subject) has been in operation since April, 1857.

I have rarely made inquiry about any works for which the blocks I prepared were intended, but I remember one upon the spirit doctrine, edited by William Howitt, and published by the Messrs. Routledge in 1857, containing eight engravings from blocks prepared by me. Also an edition of Longfellow's Poems; by the same firm, with a frontispiece portrait; a few months later I sent a frame containing three blocks, one of them a subject measuring eleven by nine inches, to the London Society's Exhibition of 1858; perhaps some visitors may yet remember them.

It may be that this process, which I have used in the practical department of the art, will be found of service in other hands; and as many are now giving their attention to the subject, I wish to contribute as far as I can to the general stock of information upon it.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 27th February, 1861.

The subject of photographing by the Electric Light continues to claim a large share of our attention in this metropolis; and a special meeting of the society is appointed early in the next month, to be devoted entirely to experiments in that direction. Bingham is engaged with one of Professor Way's Mercurial lamps, and fine results are expected from his superior appliances. We anticipate that our May Exhibition will be rich in specimens produced by the aid of this rival of the sun.

Peroxide of hydrogen, or oxygenized water is soluble in ether. Schönbein, whose name is inseparable from the history of oxygen, has contrived to effect this solution easily in the following manner. He decomposes 15 grains of binoxide of barium with as much diluted hydrochloric acid as is necessary to saturate the baryta. Then add it to about 10 drachms of pure ether, and afterwards separate the supernatant ether from the aqueous solution of chloride of barium. This ether is saturated with peroxide of hydrogen: it gives an intense blue with chromic acid; it deprives permanganate of potassa of its colour in disengaging its oxygen, it turns the tincture of guiacum blue in presence of globules of blood. It is a curious fact that the ethereal solution of oxygenized water may be submitted to distillization without removing its properties. On the contrary, they are destroyed when the ether is treated with common water, and still better by a very dilute solution of potassa.

It is well known that iodine and starch form a compound of a beautiful blue tint; this is iodide of starch: and also, that when this compound is boiled it parts with its blue colour, to resume it again upon cooling. This complex phenomenon, hitherto unexplained, has been examined by Baudrimont, who has arrived at the following conclusions from his experiments:—

1. A solution of iodide of starch remains blue even at ebullition, whenever the iodine is in excess.

When a solution of iodide of starch is heated in a test-tube, we perceive the violet vapours of iodine disengaged from the liquid, while at the same time it becomes discoloured: but if, without stopping the ebullition, a few drops of a solution are added, the original blue colour reappears.

2nd. The decolouration of the iodide of starch by heat is due to the separation of the iodine, the vapours of which remain stagnant on the surface of the liquid.

By a remarkable experiment M. Baudrimont shows two test tubes of equal capacity, each containing a similar quantity of a slightly concentrated solution of iodide of starch, were kept in a state of ebullition for the same length of time, until the blue tint disappeared; then air was blown into one of the tubes, at first into the partial vacuum, and then into the liquid itself. The tubes then left to cool, one resumed its original blue colour in all its intensity, while the other, into which the air had been blown, remained much less coloured.

3rd. The phenomenon of the recolouration of the cooled liquids is due to nothing else than to a redissolving of the volatilized iodine, which re-enters the mass of the liquid from its surface.

Two equal quantities of very dilute iodide of starch were put, one into a broad capsule, the other into a narrow vessel. After both were brought to a state of ebullition, a current of air was blown through the liquid in the capsule: now it was seen. that while the liquid contained in the narrow vase resumed its primitive blue colour upon cooling, that which had been submitted to the current of air remained colourless. M. Baudrimont thinks that the current of air facilitates the expulsion of the vapours of iodine. To determine positively that the decolouration of the iodide of starch is due solely to the evaporation of the iodine, the experimenter enclosed in a tube sealed at both ends, a dilute solution of blue iodide of starch, and although it was heated and cooled thirty or forty times in succession, it always exhibited the two-fold phenomenon of decolouration and recolouration, without losing much of its intensity of colour: which result is very different, as has been shown from what occurs in the free air.

Fluoride of mercury is usually met with under the form of small yellow crystals. Mr. R. Finkiner obtains this substance either by adding an excess of recently prepared protochloride of mercury to a solution of fluoride of silver, or by treating carbonate of mercury by hydrofluoric acid. The formula of these little crystals is $Hg^2 Fl$, their principal properties are:—that they are partially decomposed by the simple action of water into mercurial oxide and hydrofluoric oxide. This decomposition also takes place, probably in a moist atmosphere, for the salt blackens spontaneously in the atmosphere, especially under the influence of light. Heat has less action upon it than water: in dry air it may be heated up to 500° F. without undergoing the least alteration. Treated with potassa, a solution of mercurial fluoride deposits oxide of mercury; with ammonia. it deposits a black precipitate, which subsequently becomes grey. If the liquor be filtered immediately after the precipitation, it is found to contain mercury. After a time it deposits a white salt, soluble in concentrated hydrochloric acid, and containing mercury, ammonia, and fluorine. The mercurial fluoride absorbs in blackening an equivalent of dry ammoniacal gas, To decompose this compound requires only a temperature of 212° F.

It is generally supposed that, in order to obtain a biniodide of potassium, it is only necessary to dissolve iodine in iodide of potassium. According to an experiment made by M. Baudrimont, iodide of potassium is only a simple solvent of iodine. He has observed that when sulphide of carbon is mixed with bi-niodide of potassium, this latter body abandons to the sulphur the excess of iodine it holds in solution, in passing to the state of iodide of potassium (KI). "We may conclude," he observes, "that sulphide of carbon is a more energetic solvent of iodine than IK, as it separates it from the latter."

The usefulness of the thermometer in physical and chemical researches is much impaired by confusion arising from the employment of three different scales by several great nations The old *French* scale (Reaumer's) is generally adopted in *Germany;* while the *German* scale (Fahrenheit) is adopted in *England* and in the *United States;* and the *Swedish* scale (Centigrade) has passed from the hands of Celsius to those of Christine, to succeed the scale of Reaumer *in France!*

The two fixed points in all these scales is the freezing point of water, and its boiling point, under a barometric pressure of 30 inches; now the interval between these two fixed points is variously divided. In the Centigrade scale, it is divided into 100 parts or degrees; in Reaumer's scale it is divided into 80 degrees; while in Fahrenheit's scale it is divided into 180 degrees. In the first two scales the starting point is the temperature of freezing water called the zero (0) this point is at 32° in Fahrenheit's scale.

Now these various scales are a great source of inconvenience and error, especially in converting one into another; besides, the signs − and + required to be used, which still further complicate the data. It is proposed to introduce a new scale, based on the freezing and boiling points of mercury, which would give a range of 400 degrees centigrade, and the signs − and + would be dispensed with. In that case the temperature of melting ice would correspond with 40° centigrade, and that of the vapour of boiling water (Bar. 30 in.) to 140°. Thus the necessity for using the signs −

and + would be obviated. The range between the freezing and boiling points of water would remain 100° as at present.

PHOTOGRAPHY IN GERMANY.

Elberfeld, Feb. 21st, 1861.

PROFESSOR VON BABO, of Freiburg, communicated to me last week that he has made a series of experiments on the action of peroxide of hydrogen (HO_2). In the collodion process he found that this body plays an essential part. It is regularly present at the production of glass pictures, and exercises acaording to the conditions, now a favourable, now an unfavourable influence. The action of this body seems to be one of the causes why in the collodion process the sensitiveness of the film is so much superior to all other processes. I hope to receive soon further communications. You know Schoenbein has made similar experiences with ozone.

The first who spoke of a crystallized combination of iodide and nitrate of silver, is Preuss (*Annalen der Pharmazie*). Dr. Schnauss made the first analysis of it, and found it to be: $AgO, NO_5 + AgF$. Kremer found the same formula. Afterwards Tobler and Stamm, and Risse published their researches, and brought forward the formula $AgT + 2AgO, NO_5$. Risse found also that bromide of silver dissolves in nitrate of silver, and forms with it, after the cooling of the boiling concentrated solution, a crystallizable combination of the formula: $AgBr + AgO, NO_5$. It is decomposed as well as the analogous combination of the iodide by water and alcohol. Even chloride of silver dissolves in a boiling concentrated solution of nitrate of silver. After cooling, a crystal arises, consisting of much nitrate of silver and little chloride of silver, without a defined formula. The chloro-nitrate of silver—as one would call this combination—is remarkably insensitive to light, dissolves in a little water, is decomposed by much water.

Professor von Babo publishes, in the *Photographisches Archiv*, a method of producing microscopic stereographs, or, properly speaking, the stereographic production of microscopic subjects. The microscopic photograph gives only a clear picture of a very thin stratum of the object. He hoped to get better definition on one side by the ordinary stereoscopic effect, and on the other side by focussing in the first picture the superficial parts of the object, and in the other one the deeper parts. The success was as expected. Made in the latter manner, the two pictures give, of course, no stereoscopic effect, they appear only as a more perfected design. But when the inclination of the object to the axis of the microscope is changed for each picture, photographs are obtained which under the stereoscope give the same effect as the ordinary stereographs. The photographs were produced upon collodion, and by direct sunlight concentrated by a lens. Dr. Schnauss publishes his researches as to the effect of lead salts in photography. The chloride of lead is white as the chloride of silver, but it does not blacken in the light. The iodide of lead is of a beautiful yellow colour, which changes to green under the action of light; it dissolves in boiling water. The addition of iodide of lead, dissolved in an alcoholic solution of iodide of potassium to the iodized collodion, gave no remarkable effect, although the quantity was considerable. A glass plate coated with iodized collodion, and dipped into a nitrate of lead bath, immediately yellow iodide of lead is formed in the film, which gradually becomes lighter, and seems to dissolve at some parts. If such a plate is exposed in the camera and coated by gallic or pyrogallic acid, no action of light is remarked; if some nitrate of silver is added to the developer, the iodide of the film is immediately dissolved; namely, the iodide of lead is soluble in great proportion in a solution of nitrate of silver; but no double combination of the two salts is formed. When a solution of iodide of lead in nitrate of silver is diluted by water, iodide of silver is separated, and nitrate of lead remains dissolved. The nitrate of lead is not detrimental to the nitrate of silver bath, often in the contrary favourable. A little of this salt may be introduced into new nitrate baths in order to saturate them quickly with iodide of silver. The lead salt aids the quicker formation of the iodo-nitrate of silver.

In a similar manner acts the nitrate of lead recommended by Gaudin as an addition to the nitrate bath. By double decomposition nitrate of silver is formed, which dissolves in the nitrate solution. This explains how this salt can give to the bath peculiar qualities, viz., a great ability of reduction under the developer. In this case gallic acid may be used as a developer. The gallic acid forms, with nitrate and acetate of lead, a yellowish white, with nitrate of lead a greyish black precipitate; this colouration announces a reduction, and proves the importance of nitrates in the bath. Nitrate of lead dropped into a solution of nitrate of silver produces no precipitate, but when nitrate of silver is dropped into a solution of nitrate of lead, a crystalline white precipitate of AgO, NO_3 is formed. This salt is much more sensitive to light than the nitrate of silver. When iodide of silver or lead is added to it, it blackens immediately.

I can recommend to your readers the new tannin preservative process of Mr. Russell; some experiments I made with it after the formulæ contained in Mr. Hardwich's "Photographic Chemistry," were followed by excellent results. PAUL E. LIESEGANG.

Proceedings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this society was held at the Golff Club House, February 18th, 1861, the President C. HEISCH, Esq., F.C.S., in the chair.

The minutes of the last meeting were read and confirmed.

The CHAIRMAN said he had great pleasure in informing the society that Mr. Negretti had kindly brought down a number of very beautiful views for their inspection, and had also promised them some interesting particulars concerning them. Before asking him to proceed, he wished, however, to make a few remarks on a subject to which he had recently drawn their attention, viz., the toning of positives. He then said:—The remarks I made on this subject, a short time since, have called forth a good deal of opposition, and I make no apology for again referring to it, because it is so all-important that it cannot be too fully discussed. At the present moment, too, toning is under consideration at the London Society, so that the time is particularly favourable for a complete investigation. I have been accused of a wish to drive people back to the abominations of sulphur toning, yellow skies, &c., &c. Such accusations are simply absurd, as anyone taking the trouble to read my remarks, will at once see. I stated the precise method which had, in my hands, yielded permanent prints, and I am not to be made responsible for the result of a very different mode of proceeding. Some remarks of quite another character, however, appeared in the *British Journal of Photography*, from the pen of its much respected editor, and to these I replied in a subsequent number of the same journal. In the current number the editor has done me the favour to reply to this communication, and Mr. Hardwich has also referred to my remarks; but neither of these gentlemen has really touched the question which I raised. At the risk of a little repetition, I will re-state what I consider the weak point in the alkaline process. It is this; that the pores of the paper, when immersed in the hyposulphite, are filled with a mixture of chloride of gold and carbonate of soda, precisely the same substances which are put into the hyposulphite of soda in the modification of the older process which I have for years employed, so that any decomposition which in that process takes place in the bath, takes place in the paper in the alkaline process. If any deposit take place in the old bath, it can be removed; in the new process it must remain in the paper. The editor of the journal above referred to, in his first article dismissed this by saying that the pores of the paper were not full of the substances in question, as it was customary to well wash the prints before placing them in the fixing bath. This assertion led me to read over again all that had been written on the subject, to find if any such elaborate washing as is necessary *to remove the solution from the pores of the paper*, had been any where recommended, and I find nothing of the kind. Mr. Hardwich (one of the great apostles of alkaline toning) simply says, "wash for an instant under a tap," that is, just remove the solution from the surface, not from the pores, of the paper. We all know the amount of washing required to remove solutions from the pores of paper; witness the time and trouble required in the last washing of our prints, and I fear if such a washing be needed between toning and fixing, the process would meet with but little favour, and stand a very bad chance of being generally well carried out. In my reply to the first article, I pointed out these facts, but in the second no notice is taken of the matter; but I am told that I have not pointed out a weak point in the process. I think I have. Mr. Hardwich, while not noticing this point, incidentally makes my objection even stronger than I did, by converting what I spoke of as only probable into a certainty. He says, "In all cases, a liberation of sulphur takes place on mixing the above salts (chloride of gold and hyposulphite of soda) even supposing the free acid to be removed from the chloride of gold by neutralizing with a base." Therefore sulphur must be deposited in the pores of the paper. I also pointed out in my letter to the *British Journal*, what has too much escaped attention, that toning goes on as much in the hyposulphite as in the gold, inasmuch as the colour of the prints is totally different when they leave the so-called fixing bath, to that which they possess when they go in. To what is this colouration due, if not to some reaction between the matter of which the image is composed and the hyposulphite? The respected editor of the *British Journal* adroitly gets out of answering this question by taking hold of my remark, that if it were not so ammonia might be used instead of hyposulphite, and says, you can use ammonia, and your prints will then be the same colour as when they leave the gold bath. Of this I was aware, but it does not affect the question of the prints whose colour has been changed by immersion in hyposulphite. I have never met with any paper which would give agreeable tones if left as they came from the gold bath, and such seems to be the general result of experience. Mr. Hardwich evidently counts much on the change of tone thus effected, and even goes so far as to say better tones are to be got by using old hyposulphite, which looks to me very much like depending a good deal on sulphur for your tone. My belief is, that the final colouring matter of the prints in both processes is the same, and that in the alkaline process, you have at least a chance of a deposit in the pores of the paper, which you have not in the other. I do not think that the quantity of gold deposited on the picture could materially protect it against any injury this deposit may produce, particularly as on the white parts of the picture no such film of gold exists. Whether this deposit is of any consequence, I do not at present pretend to say, but I shall watch it carefully before altogether giving up my old friend. In reading over again what has been written on this subject my attention was attracted by one statement which had before escaped me, viz., that papers prepared with chloride of barium could not be used for the alkaline toning. I have, as most of you know, always advocated barium papers as yielding more stable pictures, and requiring less over-printing than others. I continued to use them with the alkaline toning, and still found them far preferable. I have recommended them to a good many, and none who have once tried them will ever use any other. All Mr. Heath's pictures in the Exhibition are printed on barium paper and alkaline toned. I also produce some printed and toned in the same way. The reason given for believing that these papers could not be used, is so curious that I can only attribute it to utter inadvertence. It is, that when the barium salts come into contact with the carbonate of soda, carbonate of barium will be deposited. Now in the first place, when the paper is on the silver bath, most of the barium remains in that bath as nitrate, and what little is left in the paper in the soluble condition (and that only could be affected by the carbonate of soda) is removed along with the free nitrate of silver in the preliminary washing of the prints. Practically, I believe barium papers are very superior, as correcting all tendency to blueness of tone.

In conclusion, I would remark that all authorities, Mr. Hardwich included, are agreed that prints properly prepared by the double hyposulphite process are "permanent," a word which does not admit of degrees of comparison. I trust that alkaline prints will prove so too, but I cannot admit that experiments with moist sulphuretted hydrogen, are parallel with the wear and tear of years. That which might stand one might yield to the other, and *vice versa*.

It must also not be forgotten that my attention was called particularly to this point by observing signs of fading in some alkaline toned prints. This must of course only be taken for what it is worth, but it is a fact as far as it goes. Mr. Negretti, who is present, must have had great experience in printing, and I shall be very glad to hear if he has made any observations on this subject. I produce some prints of various ages, with one exception none less than four years old, which show no signs either of fading, or yellow skies. There is one also toned with sel d'or after having been fixed in hyposulphite of soda, in the year 1851, a process now pronounced by some to be impossible.

Mr. Negretti said that he could give no decided opinion on the relative stability of prints toned by the two processes; but he might mention as a fact, that many of Mr. Frith's last series of views in Egypt, which wére toned by the alkaline process, had faded, while the earlier series, toned in hyposulphite and chloride of gold, were still perfect. The washing in both cases having been equally carefully conducted. One circumstance, however, he thought would materially interfere with the use of the alkaline process in large printing establishments. This was, its effect on the health of the operators. He had himself introduced it in his business, and his operator's hands were very shortly afterwards covered with pustules, which broke and became bad sores. Thinking this might be due to something in the man's constitution, he had set others to the work, but always with the same result. At the skin hospital, where these men had gone, they pronounced them poisoned by the gold bath. In one man the poisoning had gone so far as seriously to affect his sight. He (Mr. Negretti) had been obliged to return to the old process, and if he ever proposed to have anything toned by the alkaline method, he was told by his employés that he must do it himself. Mr. Hayward, of the firm of Frith and Hayward, had also suffered from the same cause.

Mr. Negretti then exhibited a large number of transparent stereoscopic views in Java, Japan, and many other places. The luxuriant tropical scenery was very finely rendered. and some of the pictures illustrating native customs excited much interest.

Mr. Negretti stated that the pictures were printed on albumen, by a process, the details of which he had given at the London Society six years ago, and were toned with a mixture of chloride of gold and hyposulphite of soda. He believed this process was identical with that used by Ferier, who, indeed, had shown it to him.

Mr. Glaisher asked, if this were so, why the French pictures were undeniably better than any produced here?

Mr. Negretti said he believed there were two or three reasons for this. First, Messrs. Soulier and Ferrier used almost exclusively albumen negatives, instead of collodion, and these would bear pressing more firmly against the plate in printing than even well varnished collodion negatives, and besides, there was no varnish between them and the plate on which they were printed. So liable were collodion negatives to be injured by printing on albumenized plates, that when he had a very fine one, such as one of a Theatrical Performance before the Emperor of Java, a print from which he produced, it was kept from absolute contact with the plate by a thin paper all round the edge. In order to prevent, as much as possible, any light going obliquely through it, it was then placed at the bottom of a box some feet in depth, and exposed thus to light from the sky. Another reason was that Messrs. Soulier and Ferrier were able to attend to the printing themselves, and their great experience enabled them to tone better than could be expected from any one who simply did it because he was paid to do so. He believed that if the English amateurs would take up the albumen process, and give as much time and attention to it as they did to other processes, the French pictures would soon be equalled. He then remarked that it had been supposed by some that the negatives of Soulier were larger than the positives, and were reduced in the camera. This he knew to be a mistake. He had seen numbers of their negatives, amongst others, the Bridge of Prague, and they were all stereoscopic size. In order to get the prints in the right direction when viewed as Soulier's are, through the glass on which they are printed, the negatives are taken through the glass, the focussing screen of his camera having the ground side towards the operator.

The Chairman asked Mr. Negretti how long he found albumen plates could be kept after being rendered sensitive?

Mr. Negretti said, for the purpose of printing not more than three or four days. He preferred rendering them sensitive at night, and printing in the morning.

After some further conversation, it was proposed by Mr. Glaisher, seconded by Mr. Spurrell, and carried unanimously, that the best thanks of the society be given to Mr. Negretti for his kindness in bringing his views, and affording so much information concerning them, and the meeting adjourned.

South London Photographic Society.

The usual monthly meeting was held in St. Peter's Schoolroom, Walworth, on the evening of Thursday, February 21st. The Rev. F. F. Statham, B.A., F.G.S., in the chair.

The minutes were read and confirmed, and some specimens and apparatus were examined. Amongst the former were some exquisite card portraits by Mr. Lacy, of Ryde, and a fine specimen of reproduction from an oil painting, which was contributed to the society's portfolio by Messrs. Sydney Smith, and Valentine Blanchard.

A very large and handsome Kinnear's camera was shown by Mr. Meagher. It was intended for plates 18 in. by 16 in., and was fitted with double backs for dry plates. The outer dimensions were 21½ in. by 9¼ in. and 5 in. deep. The full extension of the bellows gave a focal range of 33 in., whilst a cone, with which it was furnished for placing in front, extended the range, for copying purposes, to 60 inches. It was of polished teak, and was fitted with all the adjustments described in a former number of the Photographic News.

The following gentlemen were elected as members of the society:—Mr. Wm. Price, Mr. Burrows, Mr. James Contençin, and Mr. J. Baldwin.

Mr. Burr, in the absence of Mr. Fry, who had undertaken to open the further discussion on the application of photography to astronomical, meteorological, and magnetic registration, made a few further remarks on the subject. He had, in the first place, to call the attention of the meeting to one of the first daguerreotypes of the moon. It was taken by Mr. Bond before 1851, and shown at the Great Exhibition of that year. It was his impression that all these daguerreotypes had gone back to America, but he was happy to be able to exhibit the present specimen, which was very delicate and full of detail. In regard to the question which had been raised at the previous meeting, as to the varying relation between the visual and actinic foci, he had made one or two experiments. He had not had an opportunity of testing for variation of the actinic focus, but he had done so in regard to the visual. It had already been ascertained that the actinic focus did vary, but no observation appeared to have been made in regard to the visual focus: and he had thought that if, on observation he had found any variation in the visual focus from atmospheric or other causes, it might be assumed that the variation in the visual and actinic focus were coincident and in similar ratio. He had not, however, detected the slightest variation in the visual focus during the last month, during which, however, he had only had a variation of temperature of about eight degrees. Whatever might be the truth, however, on this point, he thought there could be no doubt as to the superiority of the reflecting over the refracting telescope for photographic purposes. There was an explanation of the possible varying relation of the foci, which had been suggested to him by Mr. Huggins. It was the effect of temperature on the glass itself. He had a famous object-glass, made by Clarke of America. It had been used by Mr. Dawes, who knew its powers well. On parting with it, he explained that it had its best point of temperature, which showed that there might be some change in the condition of the glass, most probably in the flint glass. There was another point. At the last meeting he had quoted a statement made by Mr. Warren De la Rue to the effect that he had gained very little in time by his contrivance to receive a direct image, and dispense with the necessity of a second reflection. Some doubt was expressed as to the correctness of this idea; but he thought a statement by such a careful and able observer as Mr. De la Rue should be received as of some authority. Mr. Burr then proceeded to suggest an explanation in the possible similarity between the actinic rays and the non-luminous heating rays which did not readily pass through glass; as illustrated by the method of keeping greenhouses warm during the night. An allusion had been made at the last meeting to the effect that we did not know whether the moon sent heat to the earth as well as light. It had been ascertained by Mr. Piazzi Smythe, in his experiments on Teneriffe, that the moon did send a small amount of heat to the earth. It was probable that a good deal of the heat actually reflected by the moon got absorbed in its passage through the atmosphere in dispersing clouds, as it was generally observed that there were fewer clouds at the time of the full moon than at other times. Mr. Smythe had found, by the use of his thermo-multiplier, that the amount of heat from the moon actually reaching the earth is about one-third of that given out by a small candle placed fifteen feet from the apparatus.

Mr. Hughes said one of the chief advantages of photographic meetings was the examination and comparison of experiences, not the mere taking for granted of statements opposed to general experience; and it was a circumstance perfectly familiar to daguerreotypists that they lost a large amount of light by reflection, and of actinism in a similar ratio. He had received, however, what appeared a satisfactory explanation of the apparent discrepancy, from a conversation between Mr. Simpson and Mr. Dallmeyer, in which the latter suggested that in Mr. De la Rue's case the rays striking the reflecting prism amounted almost to parallel rays, whereas, the rays striking the reflector of the camera, many of them fell at a considerable angle. Regarding the question of a varying relation between the visual and actinic foci, he would simply repeat that all photographic experience was opposed to the idea; and it seemed to him reasonable to endeavour, in the first place, to eliminate every other source of error prior to coming to such a conclusion, which, if proved, would involve a much larger question, and tend to throw doubt upon the value of all photographic lenses. Regarding the question of the loss of light by reflection, he knew Mr. Simpson, who had recently visited the Observatory could say something interesting on the subject, and hoped the Chairman would call upon him for some details.

Mr. G. Wharton Simpson, in response to the chairman's call, said he had the pleasure of a recent visit, by the permission of the Astronomer Royal, to the Observatory at Greenwich, in company with Mr. Fry. It was the intention of that gentleman to have detailed some particulars of that visit in opening the present discussion, and he (Mr. Simpson) had not come prepared to enter into any account of it. In the absence of Mr. Fry he would, however, refer to one or two points. They had confined their visit to the meteorological and magnetic department, and had there the pleasure of witnessing in operation the beautiful processes for magnetic and meteorological registration, which Mr. Burr had so ably described at the last meeting. Mr. Glaisher, the superintendent of that department, had with much courtesy entered into very interesting detail as to the working of the various processes. Regarding the explanation of the existence of reflection without loss of light or actinism, to which Mr. Hughes had referred, he (Mr. Simpson) had been especially struck with a fact to which Mr. Glaisher had called his attention. In one case where it was required to obtain two distinct pencils of light from one flame, to trace two parallel lines at a few inches from each other, one was obtained by the direct action of the light, and the other by means of a double reflection by means of two prisms; the image of the flame was received on one prism placed opposite to it, and was again thrown on to the surface of another prism placed in a tube at the proper distance beneath it, the reflection from the second prism being brought to a focus on the sensitive paper where its action was required. Now, contrary to what might have been anticipated, the actinic power of the light which had undergone two reflections was not perceptibly less than that derived from the direct action of the same jet of napthalized gas,—the images produced directly and by reflection being both equally clear and vigorous. In a subsequent conversation with Mr. Dallmeyer on this subject, that gentleman had suggested that the rays of light proceeding from any body parallel to the reflecting surface and impinging upon it directly at right angles, suffered very little loss; it was only when these rays struck the reflecting surface obliquely, that much loss was suffered, and the loss was just in ratio of that obliquity of incidence. By the rays striking a reflecting surface at an angle of 75 degrees, about 370 out of a 1,000 were lost. This circumstance would account for the difference between the experience of the daguerreotype artist who received his image on a small reflecting surface, and consequently lost many of the rays, and that of Mr. Warren De la Rue and Mr. Glaisher. There were one or two other points to which he would advert as interesting to photographers. He had been struck with the beautiful certainty Mr. Glaisher had obtained in his operations. One sheet of paper was prepared and placed upon the cylinder to receive the magnetic registration of twenty-four hours. The professional portraitist or the landscape photographer had opportunity of trying several pictures of the same subject; if one failed, another might succeed; but here, the failure of this one sheet would be the loss of a day's records. In reference to the extreme sensitiveness of the paper used for these records, Mr. Glaisher stated that his object had not been so much to prepare a paper with the highest possible degree of sensitiveness, as one which would retain, during twenty-four hours, the most uniform rate of sensitiveness. The explanation of this distinction arises out of a curious fact which he stated as constantly occurring in his calotype experience. He had always found that the action of light once set up in the excited calotype paper, continued progressing after the exposure had ceased. Thus, of two sheets of paper exposed in one day and developed in the evening, the one exposed in the morning would require only three minutes to come out as perfectly and vigorously as a sheet exposed six minutes with exactly the same amount of light later in the day. The difference being, that the action of light set up in one had continued for some hours after the sheet was put away, whilst in the other development followed at once, and the whole effect had to be obtained by exposure. Recognising this fact, Mr. Glaisher had to produce a paper which should retain, as nearly as possible, an equal degree of sensitiveness during twenty-four hours, so as to get uniform action during that time. He had certainly succeeded admirably. The paper was prepared, if his memory served him correctly, first by a treatment with a solution of iodide and bromide of potassium, 8 grains of the former to 12 of the latter, which was applied with a glass rod. It is then sensitized, also by the aid of the glass rod, with a 50-grain silver solution. It was placed upon the cylinder damp, and, by means of a piece of wet rag wrapped round one end of the inner cylinder, a slight amount of moisture was maintained during the whole time of exposure. There was no visible image produced by the pencil of light, but the development, with a saturated solution of gallic acid, gave generally a most satisfactory and well-defined image. The process appeared to possess the utmost certainty, and Mr. Glaisher might fairly be said just to have hit the maximum of sensitiveness to artificial light combined with uniformity. Another point of interest to photographers was the artificial light used to obtain these registrations. The usual yellowish orange-colour of the gas would be comparatively useless without the contrivance for combining with the common carburetted hydrogen the vapour of naptha, which gave a beautifully pure white flame. This was effected by diverting it from the usual pipes and making it pass through a naptha box, where it traversed 20 or 30 feet of pipe, and was made to combine with the vapours produced by heating naptha. The qualities communicated to this gas by this process were most important in a photographic point of view, for the flame seemed to acquire a very large amount of actinic character. Mr. Glaisher described the process as simple and inexpensive. Before sitting down there was one more suggestion he would make, which was that the mode of preparing paper adopted by Mr. Glaisher seemed, from its sensitiveness and certainty, peculiarly suited to the purposes of gentlemen who were experimenting in the production of developed prints by means of the solar or other enlarging camera.

After some further conversation,

Mr. Burr at the request of Mr. Hughes, made a few remarks on the connection between magnetic perturbations and the spots on the sun, which recent observations seemed to have established, showing that magnetic undulations were caused by changes taking place in the sun. Looking at the question in this light, he said we might regard every vibration of the magnet as a telegraphic message from the sun. Independent observers at different times and places had found there was a periodicity in the recurrence of those perturbations known as magnetic storms, and that in the presence of spots in the face of the sun, and that the maximum and minimum periods of both occurred together.

After a few words from the Chairman on the interest and importance attaching to the subject.

Mr. Howard read a paper on the "Practical Details of the Fothergill process." (See page 99).

Mr. Thomas Clarke handed round for inspection, some stereographs from negatives prepared by the Fothergill process, which had only been exposed 20 or 30 seconds.

Mr. Hughes remarked that, with all due deference to Mr. Clarke, he must urge the importance of abundance of exposure, and the specimens handed round, he thought would have been better if they had been exposed at least twice as long. He thought one of the chief charms of the best pictures in this year's Exhibition arose from this very circumstance that they had been exposed sufficiently to give transparency and detail in the deepest parts of the deepest shadows. The tendency of good photographers was to expose longer than of yore, and the consequence was a softness, a delicacy, and truth, before unattained. He would refer especially to two illustrations, the pictures of Bedford and Mudd. He had recently been in conversation with an intelligent amateur, who remarked that Mr. Bedford regarded full exposure as a *sine qua non* in the production of first-class results, and mentioned one picture to which he gave twenty-five minutes exposure with wet collodion.

Mr. Clarke thought that in some instances energetic and long development might be substituted for long exposure.

Mr. Hughes thought not. Where extreme rapidity was necessary, wet collodion could be used; but it was an important point to remember that the value of a picture did not depend on the rapidity with which it was produced, but upon its excellence when finished.

After a few words from Mr. Howard confirmatory of this view, and some remarks from the Chairman,

Mr. Wall laid on the table a continuation of the report of the Experimental Committee, and moved that it be taken as read. (See p. 90, in our last.) He announced that a meeting of the Experimental Committee would be held at his studio on the following Wednesday evening.

Mr. James Contençin then read a paper on "Photographing on Wood for the Engraver." (See page 100).

Mr. Valentine Blanchard remarked that it was customary with valuable wood engravings to soak them in turpentine when they came out of the hands of the engraver which rendered them unabsorbent of water. He should imagine that such a preparation would prevent silver and other solutions penetrating even better than the varnish named.

Mr. Hannaford had made some experiments in transferring the collodion film to the wood block, which he had first coated with gelatine. He had used a transparent positive for the purpose. He had not carried out the experiment to any practical extent, but so far as he had himself tried it with the graver, it appeared to cut crisply, and might, he thought, be made to answer the purpose. He also referred to some experiments he had now in hand for producing similar blocks to those of Herr Pretsch, regarding which he had sanguine hopes of success.

Mr. Howard suggested that the great difference between the delicate gradations of tone produced by the photograph, and the mode of rendering tones by lines and hatching in wood engraving, would be a great difficulty in the way of using photography on the wood block.

Mr. Contençin said that undoubtedly those engravers who were merely mechanical would not succeed; but some were artists, and able to cut blocks prepared in tints.

Mr. Wall had executed drawings on wood for the engraver, which were washed in Indian ink.

Mr. Simpson could not but think there were difficulties in the way which they were not fully realizing. He remembered, as as early as 1854, an engraving appeared in the *Art Journal*, stated to have been photographed on wood by Mr. Langton. It was not stated how the photograph was done, but it was stated that he had been able to do it for some years, Yet in the face of the means being in existence for ten years, photography was still comparatively unused by engravers. He thought the real difficulty existed, not so much in methods of obtaining photographic impressions on the surface of the wood, as in the impossibility of translating the multiplicity of delicate gradations of tone in the photograph into the few effects obtainable by line hatching in the engraving, without the intervention of a draughtsman familiar with the work.

Mr. Contençin did not ignore the difficulties, he merely suggested that there were some engravers able to meet them.

Mr. Wall did not see that the difficulty was at all insuperable. If the photograph contained 200 tones, and a wood engraving only 12, it would be the business of the engraver to represent the 200 tones of the photograph by the 12 possible in the engraving.

Mr. Simpson contended that this was just the difficulty. It was supposing the wood engraver to be able to classify the 200 tones of the photograph into the 12 of the engraving, and arrange them so as to produce the right effect, which was really the work of an artist possessing the requisite technical skill. Mr. Bolton, who had recently made a claim on the subject, was, he believed, an accomplished and artistic wood engraver, and a photographer. His pictures he (Mr. Simpson) believed were not fixed, but required to be worked in a subdued light. Possibly a process similar to that proposed by Mr. Crookes was used.

An animated conversation then arose, in which Mr. Wall, Mr. Contençin, Mr. Hannaford, Mr. Simpson, and others took part. After which—

The SECRETARY read the following announcement:—It is requested that all monies due to the Society will be at once paid, or forwarded to the Treasurer, Mr. Frank Howard, of 12, Whittingham Villas, Studley-road, Stockwell. Each member's subscription merely covering the expenses of the presentation print and the year's subscription to the journal, the Treasurer is inconvenienced by such non-payments and the cash absolutely required for current expenses. The Committee have incurred sundry expenses for table accommodation, for small expenses connected with the Experimental Committee, &c., sums trivial in themselves, but of importance to so young a society, with so small an annual subscription.

A paper was announced on the subject of "Intensifying Processes as Adjuncts to Instantaneous Photography," by Mr. Valentine Blanchard.

After the usual votes of thanks the proceedings terminated.

Photographic Notes and Queries.

PERMANENCY OF ALBUMENIZED PRINTS.

SIR,—Some discussion having taken place lately on the subject of the relative permanence of the old and new toning process, will you permit me to ask the gentlemen who have taken part in it, whether the idea has ever suggested itself to them, that *no process* of toning *can ever* be permanent with *albumenized* paper? or in other words, whether there is not a something in the composition of the natural albumen that will always, sooner or later, cause the fading of the positive proof? at least, an experience of six years, has convinced me that plain paper proofs, even by the worst of toning processes, are less liable to change, and never, as far as I have witnessed, become of that awfully jaundiced complexion (that we so often see in albumen prints) whether it be the slight trace of sulphur said to exist in the natural albumen, or from whatever cause it may arise, I fully believe that even the excellent toning process now in use, although it may tend to defer the day of doom, will not altogether avert it, instead, therefore, of devoting every attention to the toning part of the process, permit me to suggest to those who possess both time and talent to devote it to seeking some good substitute for this treacherous compound, which I fear has found more favour than it deserves, on account of its usefulness in the dry processes. I am, sir, yours &c. B. L.

ANOTHER GHOST.

SIR,—In the last number of your journal appeared a letter from Mr. F. Lane, recording a curious photographic phenomenon; which, as it appears to be of rare occurrence, may be worthy of corroboration.

Some time ago, having a number of dirty glass plates, and wishing to utilise them, I cleaned them with every possible care to ensure chemical purity, and took some of them out with me to photograph a view in the neighbourhood of Dublin. As it happened, I somewhat under-exposed the plate, and on development was much astonished to see a ghostly image of a lady, who had sat to me for her portrait at least a month before, looming through the lendscape. The features, dress, and accessories were quite distinct, although too weak to print from—but I kept the double negative as a curiosity for a long time, until, in one of those unfortunate moments too common to photographers, it was broken. From the great care I took in cleaning the plate I am inclined to think that, under peculiar circumstances, the photographic image, and of course the chemicals used in its production, pass beyond the mere collodion film, and act on the surface of the glass itself. It may be that the particular glass in question was of a partially absorbent nature, and became impregnated with the sensitive iodide of silver. It would be a curious result to Mr. Lane's and my experiences if an absorbent glass should be discovered, which would supersede collodion as a *couche* for the sensitive chemicals.
—I am sir, yours obediently. J. J. COGHILL.

PHOTOGRAPHIC PIRACIES AND COPYRIGHT.

DEAR SIR,—In your last number of the NEWS (129) under the head of "Royal Portraits," you remark, "We noticed the other day * * * a whole series of card portraits, which from want of sharpness and the peculiar grain of the paper, which pervaded the prints, bore unmistakable traces of being copies," of course implying pirated; might not these have been *copied* by the firm that issued the originals, I suppose owing to their being "worn out," as I have seen several sets bearing exactly these signs, which were no piracies, but actually bearing on the back the names of a first-class London photographer, and also that of a publisher of Haymarket notoriety, which would disgrace even a minor *local* establishment, much more one we generally hear spoken so highly of.

Do not think, Mr. Editor, that I am trying to throw a blind over these thoroughly dishonest practices, for no one would sooner "show up," any one really pirating; but as a lover of fair play, I hope you will insert this.

In No. 128, in answer to "Lex" you say, "He may photograph copyright engravings for his own private amusement," I would tell "Lex," for his own sake, that the new law, (and no doubt seems to be entertained of its being passed) will pronounce it *felony* to have any copyrights *in his possession*, however obtained: this I think should be more generally made known.
—I am, Mr. Editor, yours, &c., OXONIENSIS.

TURPENTINE WAXED-PAPER PROCESS.

SIR,—In Vol. ii, No. 50 of the NEWS appears an account of the Turpentine Waxed-Paper Process, which I am desirous of trying, but without the second iodizer, which latter, when used, I think the process should be called the turpentine-albumen process.

However, before commencing operations, I should feel obliged by answers to the following queries, or such of them as you are able to answer:—

1. For what purpose is the castor-oil added?
2. How long will the waxed papers keep? "Some time" is very indefinite.
3. Approximate exposure, lens 12 in. focus, $\frac{5}{8}$ in. stop, subject, ordinary landscape, illuminated by the sun; time 2 o'clock in the month of April?

"As long as ordinary wax paper," and "one-third more sensitive," being contradictory, and not knowing the length of exposure required with ordinary wax paper conveys no definite information to me.

4. Will the nitrate bath become discloured when the second iodizer is not used?
5. How many hours would papers keep after exposure before developing?
6. One or more English and French make of papers, suitable for the process?
7. Price of work alluded to in the NEWS?

I trust I have not exhausted your patience by these queries. If I have, my only apology must be the near approach of Spring, and the short time at my disposal for photographic operations.
—I am, sir, yours obediently, AER.

[Will some of our correspondents, who have practised the process, kindly give our correspondent a few hints. The price of the work referred to will be ascertained by writing to Marion and Co., Regent-street, the publishers.—ED.]

CONDENSERS FOR MAGIC LANTERNS.

SIR,—Would some of your numerous correspondents, learned in optics, inform me and other of your readers interested in the subject of magic lanterns, what is the best form of condensing lenses to be used? I see, in your impression of the 7th inst., J. W. Reffitt employs a concavo-convex and a double convex placed almost close together; whilst J. R., another correspondent, uses two plano-convex with convex sides facing each other—how far apart he fixes them we are not told. I have a London made lantern by me, which has a concavo-convex and a double convex, the former made of green, and the latter of uncoloured glass; these are separated about an inch. If your correspondents would further tell us what they pay for their lenses, they would confer a favour on myself and several other of your subscribers, who have already caught this magic mania.
—I am, sir, yours, &c. C. F. B.

[The concavo-convex and double convex are theoretically best, but both will answer the purpose. Our correspondent will see that the mention of prices and manufacturers can scarcely be suitable for this part of our columns. On these points our correspondents must communicate privately with each other.
—ED.]

Talk in the Studio.

Fracnis Danby, one of England's most distinguished landscape painters of the romantic school, and an associate of the Royal Academy, died last week.

The Spectrum Discoveries. A lecture will be delivered this evening at the Royal Institution, on Bunsen and Kirchhoff's Spectrum Observations, by Professor Roscoe. We hope to give an abstract of the most inseresting features in our next.

Tho "Motoscope." Stereoscopic pictures combined with the "motoscope" are now exhibited in New York, representing persons in motion. The pictures are mounted in the ordinary way, and viewed in a stereoscope which differs from the common instrument only in having a metal screen worked by a spring which alternately passes before the lenses.

Card Portraits.—Tho rage for these portraits is so great in New York, that in many establishments it is necessary to make appointments for sittings a week in advance. A dozen negatives are generally taken.

New Electric Light.—M. Wesolowski of New York has patented an apparatus for obtaining light by frictional electricity. His claim lies for the application and use of bisulphurate of carbon, or any other equally inflammable liquid capable of being decomposed and ignited by an electric spark, and contained in an insulated vessel, in combination with a frictional electric machine.

North London Photographic Association. The usual monthly meeting of this society was held on Wednesday evening. A paper was read by Mr. Barber on a new method of preparing pure nitrate of silver, from metallic silver alloyed with copper, and some remarks by the same gentleman on the sources by which silver is contaminated by organic matter. A brief paper was also read by Mr. C. Jabez Hughes, on Objections to the Hydrometer Bath Tester. The resulting discussion produced many unexpected and interesting facts confirming the value of this instrument. Details in our next.

New Photographic Society.—At a meeting of some photographic amateurs, held on Wednesday week, a new society was formed, under the name of the "Edinburgh Photographic Society." The chair was occupied by Mr. Georgo H. Slight, engineer, who in a few remarks explained the objects of the society. All present were aware, he said, that there was already a photographic society in this city, the annual exhibition of which, now open, was well calculated to improve the taste for the art both among its members and the public; but whilo that society had its peculiar advantages and departments for its members, it had been thought that there was room for another society, if it could be made more easily accessible to the amateur of moderate means, in which more freedom of discussion could be cultivated, and having more frequent meetings of an experimental character would prove more useful to the young photographer. A new society, conducted on such principles, could scarcely be called a rival to the present one, but would rather be looked upon as a useful assistant, taking upon itself no end of drudgery, by discussing subjects which might be considered as beneath the notice of the other, aiming at plain practical excellence, although, in doing so, not necessarily abjuring the refinements of tho art which they would sharo in common with their more matured parent and friend. The projectors of this society had for several months been in the habit of meeting together and and discussing photographic matters in that way, and the pleasuro and instruction they had derived induced them to wish to extend a little further, the present meeting being the consequence. A list of laws for the new society was then submitted to the meeting, which, after slight alterations, were unanimously approved of. On tho motion of Mr. Mure, tho following gentlemen were elected a council of management:—President, J. D. Marwick; Vico-President, G. H. Slight; Secretary, J. T. Taylor; together with Messrs. Robert S. Galloway, Archibald Burns, W. H. Davies, and James Ramage. It was agreed on that meetings be held fortnightly throughout the year, that summer excursions be planned, and that, if possible, a glass house be procured, in which the members might practise portraiture. After several suggestions by Messrs. Valentino (Dundee), Campbell, Flowers, and others, the meeting separated.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to the Office, 32 Paternoster-Row, London.

To Correspondents.

Seaside.—Photographic News Almanack for 1859 is ont of print.

F. P.—Add ether and alcohol in equal parts, rather use an excess of ether to dilute your gelatinized collodion to the proper consistency. "Brande's Manual of Chemistry" is one of the best books published on the subject.

G. H.—The Mackintosh cloth you send might possibly do alone; but with a lining of yellow or black calico it will do admirably.

Orwell.—Our own engagements have not left us time for trying the new American toning process; nor have we received any communication from those who have. Mr. Mac Tear of Glasgow exhibited a print toned by the process at one of their meetings; aud we at once wrote to him asking for particulars, but never received any answer.

W. A. Y.—1. It does not require starching or albumenizing. 2. The silver solution is best applied with a glass rod, and does not require the addition of iodide or bromide. 3. Slightly acid, with acetic acid. 4 Collodionized paper is best excited by floating. 5. We have never tried it; but there is no reason why you should not.

H. T. T.—Is thanked for his courteous letter. He has, however, slightly misapprehended the statement of the case regarding the first item in his letter. In the standard solution given, one ounce is intended to precipitate one grain of silver. One drachm precipitates therefore, one-eighth of a grain of silver. If, therefore, one drachm of silver solution be operated on and drachms of the standard solution instead of ounces be counted, the rate per ounce will be obtained. In fact no matter what measure of silver solution be used, if a similar measure for the standard solution be used, the rate per ounce will be indicated, and herein lies the extreme simplicity and advantage of the formula. The statement in Vol. 1 to which you refer must be an error, for which, however, we are not responsible. The number of prints a given quantity of gold will tone, depends somewhat on the paper and other circumstances, but about 500 square inches for each grain of gold is an outside approximation. The additional syllable in your quotation certainly did not improve the sense, although, fortuuately, it has scarcely made it nonsense.

Albert.—The alkaline gold toning bath had better, in all cases, after toning as many prints as it can be made to do, be thrown away and another made. Each grain of gold will, as we have remarked above, tone from eight to ten whole plate pictures, and it is best to mix just sufficient to tone the number of pictures wanted. Instead of throwing it away, it may be thrown into a separate bottle kept for the purpose, and the remains of gold precipitated with protosulphate of iron. Saturated solutiou of hypo is made by adding as much of the crystallized hypo as the water will dissolve or about 20 ounces to a pint of water. Half the proportion is better for fixing; and use it fresh.

W. H. Warner.—The red spots on the print appear to be the result of particles of something having accidentally fallen upon it; but it is difficult to say what: possibly bichromate of potash. We will propose you as a member at the next meeting of the society

J. S. R. W.—Pinholes in a negative may proceed from a number of causes, one of the most obvious is dust in the camera or the bath. It will sometimes occur from a bath being super-saturated with iodide of silver; and sometimes from the condition of the collodiou, minute portions of the iodizing remaining undissolved in it. Dust your camera well and filter your bath. If this does not effect a remedy, add a quantity of new solution to your bath. If that fails try a fresh collodion, or add a drop or two of water to that you are using: see also that it is quite free from turbidity when you use it. 2. You may add the dry oxide of silver to your bath, taking care to agitate well during a few hours. The same effect will be produced, but more time is required than when the moist oxide is used. 3. Not unless you add too much soda. Take care to reuder it neutral and nothing more. Vol. 4 of the Photographic News is now ready; but the number is limited. To have had as good a supply as might be desirable, we should have had to reprint many more of the early numbers of the volume than would have been commercially remunerative.

Oxygen.—See "Notes and Queries" in present number. We cannot describe the process of galvanizing iron in these columns. Zinc is the metal deposited.

Thos. Wardill.—The vapour of gas-tar had better be kept out of the operating-room.

A Constant Subscriber.—We believe that it would be difficult to prevent the copying of French photographs and selling them in this country; but it is obviously dishonest to do so. The law of copyright as relating to photographs, either English or foreign, is very uncertain and unsatisfactory, and in such case it is well to fall back on a law older than the common law or statute law of this country: "Do unto others as ye would that they should do to you." A silver bath after shaking up with China clay should always be filtered well, sometimes it is desirable to do it twice. The varnish drying in streaks indicates that it is not good: try some fresh. French papers are sized with starch, which facilitates toning more than the gelatine with which the English paper is sized. You can procure the plain paper of any dealer, and albumenize it yourself, if you desire. The black sediment in your toning bath is probably precipitated gold. Liver of sulphur, or sulphide of potassium, can be had of most chemists and druggists, whether they keep photographic chemicals or not; certainly, of all photographic chemists. Opinions are divided as to the best dry process. See Mr. Davis's paper in our last.

G. O. is thanked for his letter and the kind interest he expresses in the News. We value such suggestions, which shall be borne in mind. He must remember, however, there are very many tastes to please. The article in question has been waiting verification by actual experiment, when opportunity and weather could be made to coincide. It will appear shortly. We conceive the articles on Art important and necessary. The "feeling" which our Correspondent refers to as sufficing, is often dormant, and requires to be awakened; or latent, and requires to be developed, and even when awake and active, it requires directing and cultivating. Artistic feeling does not always involve artistic knowledge, whilst the latter often does generate the former.

X. Y. Z.—A pure sample of ordinary resin is recommended. Canada balsam may be used, as may also Venice turpentine. It is not absolutely necessary to use a cadmium collodion; the formula given in the former part of the Almanac may be used. Try the albumen process for interiors; it will give good results.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 131.—*March* 8, 1861.

ORGANIC MATTER IN DISTILLED WATER.

We invite the attention of our readers to some interesting experiments made by Mr. Barber—the details of which will be found in another page—relating to the presence of organic matter in new silver baths, and the source from which it is at times derived. Referring to the organic contamination of nitrate of silver, Mr. Warren De la Rue, at a recent meeting of the Photographic Society, referred to the packing of nitrate in paper, as a fertile source of such organic contamination, and a similar remark has been repeated on other occasions. In order to test how far this supposed contamination actually took place Mr. Barber took three bottles containing solutions of pure nitrate of silver in an alkaline, neutral, and acid state, respectively. In each of these he placed a piece of the common wrapping paper used by chemists, and then placed the bottles in sunlight. As our readers are aware, any organic contamination of the silver solution would have been shown by the discoloration of the solution, and the final reduction and precipitation of a portion of silver in combination with the organic matter. No such reduction or discoloration took place, however. The papers blackened, that in the alkaline solution first, then that in the neutral, and finally that in the acid solution, but the solutions themselves remained clear and unaltered. Several samples of distilled water, suspected of being a common source from whence organic matter found its way into the silver solutions, were then tested by the addition of nitrate of silver in the alkaline, neutral, and acid state. These, when placed in sunlight, showed unmistakeable traces of the presence of organic matter. The alkaline solution rapidly discoloured, then showed a deposit on the sides and bottom of the bottle; the neutral solution discoloured more slowly; whilst the acid solution was but slightly affected by the action of light.

These results would be, doubtless, by most persons, quite unexpected, and would lead to a conviction that they had not been supplied with water or kept with reasonable care. Mr. Barber is of opinion that the presence of minute traces of organic matter in distilled water might be quite compatible with ordinary care in its preparation and keeping; and might be accounted for by the accidental contact of a small piece of luting from the still, contact with corks, or with dust from time to time, &c., &c., the possible germ from which vegetation might arise and organic contamination ensue, being derived from some of these sources.

Whatever the source, that it is frequently present in distilled water is manifest, and where it is desirable to prepare a bath of exceeding delicacy and free from the slightest trace of organic contamination, the same methods which detects its presence may be employed with advantage to eliminate it from the water prior to making the bath. Two or three grains of nitrate of silver may be triturated with one grain of oxide of silver to render it alkaline, and then added to water required for the bath. This, on being in strong sunlight, will reduce and precipitate any organic matter in the water, which may then be filtered, and is ready for use. Or, the solution of the strength required may be made alkaline in the oxide of silver, placed by sunlight, and subsequently filtered to remove the precipitate.

We may add, before concluding these brief remarks, that our attention was recently called to the same subject by an intelligent correspondent, who had detected the presence of organic matter in distilled water by the use of per-manganate of potass, a very delicate test for the purity of water. He was struck with the fact that no turbidity, discoloration, or precipitation was produced on making a sixty-grain silver bath with the same water. It is important to remark, that if the silver solution be acid, the presence of organic matter will be less readily shown, and that a very weak silver solution is a more delicate test than a strong one.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Architecture.—The application of photography to this branch of art, fostered and encouraged by "The Architectural Photographic Association," has taken high rank in public estimation, and is rapidly becoming more general. In the lectures delivered at the Exhibition in Conduit Street, the importance of the camera, as so applied, is fully demonstrated, and receives high testimony; and no one can inspect the productions there displayed without being struck with the wondrous perfection they possess. Architecture, like photography, is said to be an art and a science; and it is shown that, although it has been studied by both artists and men of science, its greatest successes have been due to those eminent masters who combined the qualities of both art and science. The architect, who follows in the beaten course of mechanical labour, has but the humble province of a builder of dwellings; but in the hands of the more gifted or more aspiring, this art cultivates the very noblest of our faculties, and is full of a great philosophy, producing works which will be preserved by reverence and love when the nation of the poor forgotten architect shall have dwindled into a name only remembered in connection with his own enduring works. In photographing architectural subjects, the spot chosen for the camera must be judiciously selected. One of the great features in a fine building will be the just and proper balance of parts; and although it is quite true that some portions may have in themselves the most perfect symmetry and completeness, still they are not likely to be discovered by *mere chance;* and the operator should, therefore, make himself sufficiently acquainted with the laws of art to recognise and secure such views as do justice to the origiual design, and fairly represent the real merits of his subject. It is by no means an uncommon thing to observe photographs, otherwise excellent specimens, in which the field of view is limited to some portion of a grand old pile peculiarly uninteresting in itself, although of supreme importance in its relationship with the general effect of the whole. One building is intended to concentrate the entire greatness of the design in its general proportions: another, thick with ornament and details, can only be appreciated from a point of view which embraces but a small portion of the structure; and these considerations should, of course, have weight with the photographer of taste. It must be remembered that the general principles of art have their application in architecture as in all other branches, although of course each will give prominence to those most applicable to its own peculiar purposes.

Art.—Philosophically considered, art includes each and every process by which we acquire that which conduces to our comfort, pleasure, or improvement. In ordinary conversation, this term is very loosely applied; in consequence of which, it is a task of no little difficulty to define its exact meaning. Some arts which have attained to unusual perfection, or display in their professors a greater amount of intellectual refinement and manipulatory skill, have therefore been separated from the arts generally, under such terms as the polite arts, the fine arts, &c. Under these heads we find *Painting*, comprising, strictly speaking, all methods of producing representations on flat surfaces by pencils or pigments. *Sculpture*, or an art producing representations in partial or absolute relief. *Architecture*, meaning, not the method of building, but that which invests them with real beauty, sublimity, or grandeur as works of art: *Music*, the scientific principles of which, though more clearly explained and understood, are really those which are common to all the fine arts. It is now a question whether Photography can rightfully take rank with the arts I have enumerated or not: but sooner or later its claims *must* be admitted; and whether this be soon or far in the future will depend upon the character of photographic productions, rather than upon pretentions based upon a knowledge of the capabilities and powers of the art itself. To our practical operators, therefore, must all lovers of photography look for the advancement and improvement of the art.

Artistically.—Expressing the culture and refinement of an artist's mind as indicated in his works.

Attitude.—The pose of a model. It should give varied outlines, a proper balance of parts, be in keeping with the general expression, and be graceful, easy, unaffected, and characteristic. A graceful attitude will give a degree of beauty to the homeliest man or woman, and render the beautiful more strikingly so. Curved and undulating lines are generally aimed at in choosing the attitude, because of the harmonious and uniform appearance which then unites every part with the whole. Contrast, however, gives vigour, even although it sometimes imply the introduction of an acute angle. It is for this reason we so frequently find the head and body turned in different directions.

I have already pointed out that the attitude should be characteristic, or becoming; for instance it would not be becoming, or characteristic, or, in other words, in *keeping*, to give a plump short girl, with a lively and animated expression, the lofty carriage and queenly attitude of a Juno: nor to force upon slow moving stiff-jointed old age an imitation of that sprightly vivacity of motion which is characteristic of youth. Vigour may distinguish one pose, languor and softness another, majesty that, simplicity this, and yet all may be equally graceful and pleasing. In each case the *expression* (see *Expression*) of the figure must be consistent with that of the face and with the general characteristics of the model. (See *Animated*). *Action* understood as motion only in a limited sense, is the great source of gracefulness of attitude. All the antique models we so study and admire for gracefulness, are represented in action or motion. The fine outlines formed by a swan's neck, or seen in the bounding gambols of a beautiful greyhound, will illustrate the gracefulness which is nearly always implied in the flowing and contrasting lines of a well posed model. Look for grace in the movements of every graceful object, and you will grow in its knowledge, for—

"Graceful—yet each with different grace they *move*."

and the appearance of motion, and the grace of attitude will be nearly always found associated. In my remarks on action I pointed out a distinction between its meaning and that of absolute motion, such as is implied in a falling body, which, when painted or photographed, appears to be suspended in the air, and although it might not seem quite clear, I hope the above remarks will explain what I then meant, and what is usually meant by the use of the technicalities *action* and *motion* in reference to *attitude*.

Remember that *variety* is to be sought, but that it must not destroy *unity*, and that curvature of outline is the primary source of the latter quality; that parallel lines are ugly, although equality of parts is necessary to secure their harmonious balance; that angularity and uniformity should be avoided, although even these qualities are, *in rare cases*, to be sought as adjuncts to the expression of character. In posing, avoid getting the limbs in exactly the same position, the shoulders of exactly the same height, and the head too stiffly erect. The pose of a lady should not have that boldness of action which you would give a man, but be modest and retiring, the arms describing gentle curves, and the feet never far apart. The appearance of motion is secured by removing the centre of gravity somewhat out of the line of the supporting base. In studying these rules, of course, the subject of costume must be considered. The absurdities of fashion, and its eccentric vagaries of form and taste, will sometimes sorely try one's patience; here the photographer has but one remedy, viz. *to conceal.* For this purpose, loose drapery, such as as plaids, cloaks, scarfs, opera mantles, &c., will be best. There is a mistake frequently perpetrated of getting the front view of the body contrasting a nearly side view of the head, but with the eyes looking straight to the front. In such a case all the beauty of motion is gone, and expression is destroyed, at any rate so far as it is pleasing. When the head is in this position, the eyes should indicate that it was turned to look towards an object situated in that direction, and not merely to affect variety of outline. *Art is art only when it is not too strikingly apparent, otherwise it degenerates into affectation.*

Scientific Gossip.

On Friday evening, the 1st inst., Professor Roscoe delivered a lecture at the Royal Institution on Professors Bunsen and Kirchhoff's recent spectrum discoveries.

After a few introductory remarks, the lecturer drew attention to the different colours which certain metallic compounds imparted to flames when they were introduced into them, and illustrated this by exhibiting various flames so coloured. A compound containing the metal sodium gave an intense yellow flame; if a potassium compound were introduced, the flame became violet; lithium caused it to become an intense crimson; calcium a yellowish red; strontium a bluish red; and barium a rich green. It was then shown that when these flames were allowed to illuminate a narrow aperture, and the ray of light so produced analysed by a prism, spectra were seen which exhibit differently coloured bands of light. A diagram of the solar spectrum was shown in the first place, and the dark lines which were seen to cut it across in every part were pointed out. By passing in the same way the yellow flame caused by the incandescent vapour of sodium through the apparatus, the soda spectrum was obtained, in which, instead of all the colours of the rainbow, as in the solar spectrum, there was seen only one bright yellow line, occupying the same position as the dark line D in the solar spectrum. In the same way it was found that when the flames produced by the other metals which gave colours were examined in a suitable apparatus, each metal was found to yield a peculiar spectrum.

The spectrum apparatus in which these results could be seen was exhibited to the meeting; it consisted of a prism incased in a dark box, and on each side of the prism was a telescope, having the object glass pointed to the prism. Through one of these the spectrum was examined, and in the position occupied by the eye-piece of the other telescope (which was removed) was placed a vertical slit, in front of which the flame was placed: by looking through the telescope the spectrum of any flame placed in front of the slit could be seen and examined.

The advantage of this kind of examination was shown to be very great when the chemist had mixtures to deal with; for instance, the lecturer showed a flame which was illuminated with a mixture of 20 parts of potassium salt, and one of sodium. The yellow colour of the latter so overpowered the violet colour of the potassium, that the presence of any of the latter in the flame could scarcely be recognised. If, however, the flame were placed in front of the slt spectrum apparatus, the true spectra were separated, and were each distinctly visible at different parts of the field, where the sodium could be recognised by its bright yellow line, and the potassium by the red and violet lines which it shows. A representation of this appearance was thrown upon the screen by means of a magic lantern, illuminated by the oxyhydrogen lime light.

This holds good with mixtures of all these metallic salts. The spectra of each being perfectly independent of and uninfluenced by each other, could be recognised when the metal was in most extremely minute quantities. The value of this method of analysis was shown in the case of a mixture of five or six alkali metals and earths. In the ordinary processes of chemistry, to detect the presence of these bodies would require two or three hours hard work in the laboratory, and even then minute traces of any substance were liable to be overlooked. In contrast to this, the following extract was read from Bunsen's most interesting paper:—"I took a mixture of chloride of sodium, chloride of potassium, chloride of lithium, chloride of calcium, chloride of strontium, and chloride of barium, containing at most one ten-thousandth part of a grain of each of these substances. This mixture I put into the flame, and observed the results; first the yellow sodium line appeared on a background of pale continuous spectrum; as this began to be less distinct the pale potassium lines were seen, and the red lithium lines came out, whilst the calcium lines next appeared in all their brightness. The sodium, lithium, potassium, and calcium salts were now almost volatilized, and after a few moments the strontium and barium lines came out as from a dissolving view, gradually obtaining their characteristic brightness and form." In this manner were obtained with absolute certainty, in half a minute, what the ordinary processes of the laboratory would scarcely give in three hours hard work. This consecutive appearance of the different lines of the spectra was illustrated by painted slides in lanterns.

The extreme delicacy of this method of analysis was next pointed out; quantities of substances, the smallness of which the mind entirely failed to realize, could be detected with certainty: for instance, of soda the 3,000,000th part of a milligramme, or the 180,000,000th (the one hundred and eighty millionth) part of a grain could be recognised. The method which Bunsen adopted to estimate this minute quantity was said to be somewhat as follows:—Suppose a piece of sodium, weighing one-tenth of a grain, were burned in a large room on a piece of wet blotting-paper, its vapour would diffuse itself through the whole of the room in a very short space of time. It would thus be easy to calculate how much sodium was present in every cubic foot of air. By then calculating how much of this air would pass through the gas burners to illuminate the flame, whilst an observation of its spectrum was being taken, for two seconds for instance, the actual weight of sodium passing through the flame for that purpose could be calculated; and in an experiment of this sort tried by Bunsen, he found that no more than the above quantity need pass through his apparatus in order to be detected. By a test of this excessive delicacy it was found that sodium was always present in the air, and all bodies exposed to the air for a short time gave this yellow line. A piece of clean platinum wire, which was shown to give no yellow colour to flame, was merely touched with the finger when it at once imparted the well-known soda re-action.

Of lithium he could detect, in this way, the 6,000,000th part of a grain, and in this manner it was found that whereas lithium was hitherto only known to occur in four minerals, it was now seen to be one of the most widely distributed elements in nature; it existed in all rocks, in sea and river water, in the ashes of most plants, in milk, in human blood, and muscular tissue. The end of a cigar placed in a flame, and examined by the spectrum apparatus, showed that lithium was present. Lime also could be detected in minute quantities.

Upon examining in his apparatus the spectrum produced by the residues of certain mineral waters of Germany, Bunsen observed the presence of two blue lines which did not belong to the spectra of any of the metals with which he was acquainted. He investigated this further, and at last discovered that they were due to the presence of a new alkali metal, to which he gave the name of cæsium, which existed in such minute quantities that twenty tons weight of water had to be evaporated down in order to obtain 100 grains of the substance. A specimen of the bi-tartrate of cæsium was exhibited to the meeting, and the colour which it imparted to the flame was shown.

The lecturer next proceeded to state that MM. Bunsen and Kirchhoff were engaged in researches by which they hoped to be able to extend this analytical method so as to include all metals. They had satisfied themselves that some of the rarest metals—metals which perhaps no one present had ever seen, or was likely to see, could be quickly and certainly detected in this manner.

The second part of the lecture was devoted to an account of the way in which they had partially found out the constitution of the sun's atmosphere. We need do no more than give a very brief resumé of this part, as a week or two ago we gave, in our "Scientific Gossip," a full abstract of these important researches of Kirchhoff. By means of a comparison of the solar spectrum with those produced by certain of the metals, it was found that for every bright line in the artificial spectra there was a corresponding dark line in the solar spectrum; and owing to the phenomena of the reversion of these bright lines when a brighter light was present behind the coloured flame, the conclusion was drawn that the light from the solid body of the sun gave a continuous spectrum, in which there were no lines, but that owing to the presence in the sun's atmosphere of the metal sodium, a *reversed* spectrum of the latter metal was produced, and the fixed line D was caused. In the same manner the presence in the solar atmosphere of iron, magnesium, nickel, and chromium has been proved. "If we could see," says Kirchhoff, "the spectrum of the solar atmosphere itself without that of the solid body, we should see in it the bright lines which characterise the metals which the atmosphere contains;" the more intense luminosity of the internal core does not, however, permit the spectrum of the solar atmosphere to become apparent, it is reversed, and those lines which would otherwise be luminous are rendered dark.

In conclusion, the lecturer remarked that these researches announced the birth of a new terrestrial and stellar chemistry, the developments of which it would be impossible to foresee.

REMARKS ON MR. CRAMB'S PAPER "ON TESTING USED SILVER BATHS," &c.

BY C. JABEZ HUGHES.*

[A few words of explanation are necessary in connection with the following remarks, as they are largely of a personal nature, and as the article which called them forth was not published in our columns. We give the paper *just as it was read* at the meeting, where it elicited much sympathy and applause: and we do so the rather, because in the organ of the society, for reasons we are not called upon to discuss, it was published in an altered, and, as Mr. Hughes conceives, an emasculated form. At the meeting in question, Mr. Hughes prefaced his remarks by observing that such a paper was altogether foreign to his habits and feelings, and regretted that the necessity for severe language was forced upon him; observing that nothing but the manifest *malus animus* of the attack upon himself, and the importance of interposing a severe check upon such productions, could have induced him to bring such a paper before the society.]

SINCE our last meeting, at which I read a paper on estimating the amount of silver in the nitrate baths, &c., another one in reply has been read by a Mr. John Cramb, of Glasgow, in

* Read at the Meeting of the North London Photographic Society, on Wednesday, 27th February, 1861.

which he alludes to experiments made by his brother, somewhat similar to those undertaken by Mr. Simpson and myself, the results of which are considerably different to our own. So far then we have two series of recorded experiments on the same subject, each tending to a different conclusion. This is unsatisfactory; for either one or the other, or possibly both, may be wrong. A re-examination of the subject is obviously suggested; and I am sure you will be gratified when I inform you that it is now being done, by gentlemen whose names will be a guarantee both of the accuracy of their results and their ability for the task, and that at our next meeting I hope to lay before you an interesting report, from which we may deduce safe conclusions, not only on the question in dispute, but on kindred points affecting the theory and practice of photographic printing.

For my own part I have no object to serve but the elucidation of truth, and its practical application to daily wants; and if it shall occur that the views I have expressed are not substantiated, when tested on a wider basis, I shall have pleasure in being set right, and shall cheerfully embrace the new views; for, after all, better men than I have committed themselves to positions which enlarged experience has not allowed them to maintain.

Awaiting therefore, respectfully but anxiously, the advent of this trustworthy information, I would leave the matter, were it not for the arrogant and insulting tone in which this Mr. Cramb has chosen to couch his comments on my paper, and I would pass them over with the contempt they merit, were it not that my silence might be misconstrued.

That he should dissent from my views was quite reasonable, for if we all agreed there would be no discussion; and that he should endeavour to show me where he supposed I was in error, was not only allowable, but highly commendable; but there is a proper and courteous method of doing this, which to the credit of photographers is rarely departed from. What particular immunity this person claims that he should be an exception, I cannot surmise, unless it be that this being his first paper addressed to any photographic society, he is unaware of the amenities required, even though they be not otherwise habitual. For my own part, I am always too happy to be taught; but I can never submit to be bullied: and while bowing with submission to any one who will point out my faults, and thanking them for the act, I distinctly deny them the right to do it in offensive language. But, right or wrong, I claim to be treated with ordinary courtesy and respect, and if, in the present instance, I somewhat depart from this course, it is to show this ill-mannered person that in criticising papers read before societies he must endeavour to acquire the habits of a gentleman, and that ebullitions of jaundiced and splenetic feeling will not be tolerated.

The whole communication breathes an air of self-satisfied egotism. I do not propose to follow him through his rambling address, the whole purpose of which appears to be to pervert and distort my views, and will only remark on the experiments themselves. They are based on the principle of inferring the amount of nitrate of silver in a solution from the quantity of a standard solution of chloride of sodium required to cause complete precipitation. In the use of this method I pointed out many sources of error. These experimenters have adopted one of these sources, viz., using only a fluid drachm to estimate the quantity in an ounce of solution, whereby an error becomes magnified eight times.

What means, if any, were taken to ascertain the accuracy of the drachm measure, are not explained. As many of the bath solutions examined were very concentrated, the error of a few minims either way, especially when multiplied by eight, is very grave.

Again, as the results of this method are obtained by indirect, not direct experiment, it is of the greatest importance that as a collateral check, a solution of *known strength* should be tested in the first instance. This was done by Mr. Simpson and myself; but these parties, in the pleuitude of their confidence, did not seem to think it necessary.

They must needs make a blunder in the equivalent weight of chloride of sodium, taking 60 instead of 58.5. This alone makes an error in all their calculations of aboat 1 grain in 40, or $2\frac{1}{2}$ per cent.

The result obtained from Mr. Bowman's collodion bath is so hostile to general experience, that that alone is enough to throw doubt on all their figures.

Why was the hydrometer tried on collodion baths at all, seeing that I more than once distinctly stated that it was not suited for them? Yet in their pompous array of figures they parade no less than *five* collodion baths.

It may be remembered that this Mr. Cramb had already condemned this instrument, confessing in the same breath that he had never tried it, a mode of proceeding not calculated to favourably prepossess one as to his impartiality as a judge, and certainly the contrary of what is adopted by the usual investigators of "chemical and hydrostatical science," about which he talks so complacently. Having established his conclusions to his own satisfaction, he should, when he selects his facts and adduces his figures, bring some indepeudent third party as a voucher, being himself far from an unexceptionable witness in his own case; but this confirmatory evidence is not supplied, and I therefore dismiss these unverified figures.

I have not attempted to reply at large to this person's paper, for after all the point in dispute is not of argument but fact, and as the question must be re-opened shortly, we may patiently wait. My main object has been to resent the insolent tone in which it is written; and in dismissing this provincial cynic, I trust when he next makes his appearance it will be with a more modest and becoming deportment, and that in alluding to persons with whom he may disagree, he will make an effort to use respectful language.

A NEW METHOD OF PREPARING PURE NITRATE OF SILVER FROM METALLIC SILVER ALLOYED WITH COPPER.

BY THOMAS A. BARBER.*

One of the simplest plans for recovering silver from an old bath is that of immersing a piece of copper, slightly acidifying the liquor, and leaving it until the whole of the nitrate is decomposed, and the silver falls in a metallic powder. In this case, however, the product is contaminated with copper, from which no amount of washing will free it.

My method of proceeding is this:—After well washing and drying the precipitate, I add carbonate of soda, or borax, and fuse it in a crucible, by which a part of the copper is eliminated. It is then poured out into cold water, bringing it into a granular and manageable form.

The solution of the silver in nitric acid is effected in the usual manner; but evaporation is carried on until the resulting mass begins to fuse, so as to drive off the excess of acid.

The salt is then rubbed in a mortar with a little oxide of silver, distilled water added, and the whole boiled. The oxide of silver displaces the copper, which falls as an oxide, and is separated by filtration, together with any excess of oxide of silver.

The liquor is then a solution of pure nitrate of silver, containing a small amount of oxide of silver, which must be neutralised by the addition of nitric acid, if evaporated for crystals, or by acetic acid, if transformed into a negative bath.

I fuse the silver, and afterwards the salt, in order to economise the use of the oxide, otherwise there can be no reason why the pulverulent silver should not be converted at once into a nitrate; for the oxide will rectify a solution containing both copper and acid—in fact, nitrate of copper may by the same means be converted into nitrate of silver.

The difficulty in this process is, to arrive at the proper quantity of oxide to be used without wasting it. This may

* Read at a meeting of the North London Photographic Association, February 27, 1861.

be ascertained by testing portions of the boiling solution with ammonia, and adding the oxide gradually, till every trace of copper has disappeared.

The method generally recommended to get rid of the copper, is to fuse the mass until the nitrate undergoes decomposition. The nitric acid is driven off, and oxide of copper remains; but the high temperature necessary for this operation involves the danger of forming nitrite.

Another plan has lately come under my notice. It is to wash the deposited metallic silver with weak hydrochloric acid, and then with ammonia. I have tried the experiment, but did not find it succeed; copper was still left, and chloride of silver formed.

If nitrate of potash be preferred in place of nitrate of copper, it may be readily effected by dropping into the boiling solution some caustic potash. The product will then be contaminated with nitrate of potash instead of nitrate of copper.

I give my method more as a chemical fact than as a useful addition to photographic operations; for I have long held the opinion that nitrate of copper is no bar to the working of nitrate of silver, and this Mr. Taylor, at the Photographic Society of Scotland proved to be the fact.

Most of our baths contain potassium, cadmium, ammonium, and very likely calcium, sodium, &c.; and why object to cuprum? The salts of this metal, are. I believe, just as free from actinic action as the others. Still it is of some service, and no little pleasure, to deal with a genuine article.

ON ORGANIC MATTER IN THE EXCITING BATH.

BY THOMAS A. BARBER.*

Amongst the many causes of failure attributed to the exciting bath is one which has struck me as being somewhat singular —that of the nitrate of silver having been wrapped in paper—for if organic matter is imparted by this means, what must be the effect of its solution running through filtering paper? Certainly one is sized and the other not, but in order to contaminate the nitrate, the surface of the paper must be abraded, instead of the silver being left on or in the surface of the paper, which I am inclined to believe is the fact

To elucidate the subject, I produce three bottles of solution of nitrate of silver, 30 grains to the ounce, the first is alkaline (*i. e.* saturated with oxide of silver) the second neutral, and the third acid, each containing a slip of demy paper such as is ordinarily used for wrapping up nitrate of silver, and which have had some days exposure to light; it will be observed that in neither case is the solution darkened, nor is there any deposit of organic matter, which might have been expected, had the solutions taken up matter of an injurious tendency, or affected by the agency of light. The papers assumed their blackness in the following order, the alkaline first, then the neutral, and lastly the acid.

A much more likely source of error lies, I think, with the distilled water. Here are three bottles filled with distilled water, that has been kept some considerable time. To each I have added nitrate of silver 1 grain to the ounce, alkaline, neutral, and acid, and exposed them to the light; the one containing the alkaline has crusted the impurities on the bottle, leaving the water colourless; the neutral is dark and opaque; the acid is bright and coloured.

I have three more, part of a carboy fresh from the wholesale druggist (an indirect but general source from whence most photographers derive their supply) treated in the same manner. It will be observed that the alkaline has done its work, the neutral is bright and coloured, whilst the acid gives no evidence of presence of organic matter.

Here is a sample obtained from one of our oldest established chemists, but like every other that I have tried, it will not stand the test of a weak solution of alkaline nitrate of silver. I use weak solutions, because I find them give much more satisfactory results. Observe the difference in the colour of the same water acted upon by 1 grain and 30 grains to the ounce.

It should be understood that distilled water can never be relied upon for purity. That which comes over first (some say the first third) ought to be thrown away, nor ought the still to be used for any other purpose. Waste steam from an engine is not unfrequently turned to account. Water containing no inorganic matter suffices for almost all chemical operations, but if it be a *sine qua non* in photography that it contain no organic matter, then recourse must be had to some means for testing its presence, and such is the avidity with which the alkaline nitrate of silver seizes all impurities, that I have no hesitation in saying that if a newly made bath be dosed with oxide and exposed to the light, it is immaterial whether it be made with distilled water or not.

* Read at a meeting of the North London Photographic Association, Wednesday, February 27, 1861.

Proceedings of Societies.

London Photographic Society.

The monthly meeting of the Photographic Society was held at King's College on the evening of Tuesday, March 5th. F. Bedford, Esq., in the chair.

After the minutes of the previous meeting were read and confirmed, the following gentlemen were elected members of the society:—Thomas Sutton, Esq., B.A., Lecturer on Photography at King's College; the Hon. Maurice Wingfield; R. K. Dick, Esq.; Capt. James Buchanan, Madras; J. E. Norris, Esq.; L. Musgrave, Esq.; R. W. Hall, Esq.

Several specimens of prints were exhibited by Messrs. Vernon Heath, Fry, and others; also a large folding camera by the first-named gentleman.

Mr. Spiller read a paper describing his dessicating box, in which quicklime is used, instead of chloride of calcium, the usual dessicating agent applied to such purposes. The box was exhibited together with several excellent prints upon paper, which had been kept in the box several weeks after sensitizing. He was in the habit of using quarter sheets of paper which, after sensitizing and drying, were just thrown loosely into the box, curled up as they were. He had found on weighing a sheet of paper after coming from the box in its dry state, and then again after it had been exposed to the atmosphere to regain its ordinary hygroscopic condition, that each quarter sheet gained seven grains of moisture, weighing eighty grains when quite dessicated, and eighty-seven in its ordinary state. A full account of this drying box, communicated by Mr. Spiller, will be found at page 256 of the Photographic News, vol. iv.

Mr. Spiller also showed some varnished negatives in which the film was very much cracked, which he attributed to damp and the severe changes of temperature during the winter. He suggested the adaptation of the principle of his drying-box to common plate boxes for sensitive dry plates, and for valuable varnished negatives.

After a few remarks from the Chairman on the importance of the subject,

Mr. Shadbolt asked Mr. Spiller if the lime would have sufficient absorptive power to dry albumenized plates.

Mr. Spiller thought it would draw away the surface moisture.

Mr. Vernon Heath remarked that Marion's preservative case struck him as more convenient than the one before them, and paper might be kept in it for three months without spoiling. Would Mr. Spiller state the peculiar advantages of his own box over others.

Mr. Spiller remarked, in regard to the question of size, his could be made smaller if necessary. He had it made its present size and shape in order to admit of the sheets being thrown in just rolled up as they had dried. He did not claim anything especially new in this box. The dessicating powers of quicklime were well known before, but it had not been applied before to this purpose; and he thought it had some advantages over chloride of calcium, which was generally used.

Mr. Shadbolt remarked, that an essential difference existed in the fact that Marion's case was nominally a secret, whilst all the details of this were clearly explained; and a considerable difference in cost would necessarily result. He thought if, instead of deal, lead were used, and filled with sulphuric acid, a valuable drying box for dry plates might be made.

Mr. Hughes thought, one reason why drying or preservative boxes did not come into general use, was that the paper was not considered so good after keeping in them. There was a difficulty in getting the prints to tone well; they did not readily pass beyond the brown stage into that rich purple which was desired. He saw two gentlemen in the room who had some practical knowledge on this subject, if they would give the meeting their experience; he referred to Mr. Eliot and Mr. Fry.

Mr. Samuel Fry said, that there was a picture of his on the table, to which he would call attention, which had been kept a month after printing before toning, having been accidentally put away with some sensitive paper. It subsequently toned very well. His plan of preserving sensitive paper was a very simple one, but he found it perfectly efficient. He had a tall glass bottle, such as confectioners use; it was about 30 inches high, and had a tight-fitting glass lid. He covered the bottom with common salt, well dried, to a depth of about an inch and a half, and covered this with a piece of card. He sensitized the paper in whole sheets, and, after drying, placed them in this bottle folded round inside. He found no difficulty with sheets so kept for a few weeks or even longer.

Mr. F. G. Eliot said Mr. Sedgefield had one of Marion's preservative cases. He found them, when three or four quires of excited paper were placed in it, that the few sheets at the top and bottom were all right, but as for the whole of the remainder the effect was the same as if there had been no chloride of calcium present.

The Chairman remarked that too much atmospheric air was enclosed with the quantity of paper to render the cholride of calcium available.

Mr. Fry described a drying box he used for sensitive plates. It was a double tin box, with about three-quarters of an inch between the outer and inner portions. This was filled with hot water, and readily dried the plates.

Mr. Malone remarked that in reference to the chloride of calcium being found of no use in some cases, it was an important point to ascertain how long it had been used. It might have been so long in use as to have become fully charged with moisture. Regarding Mr. Spiller's box, the object of introducing it was quite clear. It simply came before them as a good working tool, which could be made by any ordinary workman, and which photographers could have made for themselves at a trifling expense. Chloride of calcium was more greedy of moisture than the quick lime, and if, therefore, the extreme dessication effected, were an evil, lime would be best of the two. As for sulphuric acid it was more greedy of moisture still, and would therefore be worse in that respect, whilst if the vessel containing it were upset, it would scarcely be necessary to describe the consequences. Mr. Spiller's was, he thought, therefore, the best and cheapest contrivance. But as for the thiug itself, he had no liking for the plan of preserving paper. To get the best results the paper should be excited, dried, and used as quickly as possible. If it could be shown that preserving the paper gave inferior results, he thought all questions of convenience should be put aside, and printers must rise early enough in the morning to prepare each day's paper. If keeping a short time were necessary, he remembered it used to be customary just to place the sheets in a pressure frame and screw them down to prevent the action of the atmosphere. Perhaps the adoption of such a plan might solve the whole question.

Mr. Eliot said that in the case to which he had referred, care was taken that the chloride of calcium was not charged with moisture; but that the sheets being packed close together no action was exercised, except on a few outside sheets. On this account he admired Mr. Spiller's box; it admitted of the sheets being thrown in quite, loosely iustead of tightly pressed together.

Mr. Spiller remarked that it was very easy to ascertain when the lime had lost its dessicating power. When it was slaked it fell into powder; so long, therefore, as there was a lump left its, drying powers remained.

A desultory conversation on the causes of cracking in the varnished negative film ensued, in which the Chairman, Dr. Diamond, Mr. Spiller, Mr. Fry, Mr. Thomas, and others, took part. A general opinion prevailed that damp and changes of temperature were the chief causes of such cracks.

Dr. Diamond exhibited some prints which had continued perfectly good for some years until recently they were hung in a room against one of the outside walls, and they had rapidly faded. Others of the same lot of prints which hung against the inner walls of the room were not affected.

Mr. Malone remarked that we had not yet sufficient knowledge as to the means of keeping photographs from fading, even when toned with gold, and the sooner it was admitted the better. It was impossible to keep pictures entirely free from damp and from tho influencer of sulphuretting vapours, and under existing circumstances it was merely violating a natural law to hope for their permanency. He had always insisted on this. Even with the most careful washing, it was uncertain. He had treated some with boiling distilled water which had nevertheless faded.

Mr. Heath rose to order. He wished to know what was the subject before the meeting, which he had thought was the use of drying-boxes.

Mr. Malone was merely pursuing the subject introduced by Dr. Diamond.

Mr. Sedgwick thought Mr. Malone was quite in order.

The Chairman said it was perhaps a little digression from tho original subject, but had become so by a most natural transition, and the subject was a most interesting oue.

Mr. Malone would return to the question of cracked negative films, which was connected with the drying boxes. He thought that tho varnish in many of these cases had been blamed unduly. Why might it not be some peculiarity in the collodion, or some difference in the contractible conditions of the collodion film and the varnish.

Mr. H. G. Bohn, referring to the faded prints shown by Dr. Diamond, said it was simply caused by mildew from a damp lime wall. Any ordinary picture, not a photograph, would probably have suffered just in the same way under the same circumstances.

The Chairman now intimated that the discussion on Mr. Hughes's paper "On Albumenized Paper," which was adjourned at last meeting, would be resumed.

The Secretary read a letter from Mr. Hardwich, in which he intimated his fear that the difficulties in the way of getting English paper-makers to enter into all the experiments which would be necessary, would be very great, unless we could assure them of a demand sufficient to repay the trouble.

Mr. Bohn said, one of the largest paper-makers, a gentleman who had two mills at Maidstone, was sitting by his side, and could probably give some information on the subject.

Mr. Busbridge, of Maidstone paper mills, said he had read with great interest the account of the last meeting. He felt a double interest in the matter, arising from his interest in photography and his iuterest as a paper-maker. He must confess he had looked with great jealousy on the idea that they could not as Englishmen make paper in all respects equal to that made in France or Germany. He felt sure they, as English paper-makers, had only to know exactly what was wanted, and they could accomplish all that was required. He had for some months past given the subject some attention. So far as he at present understood it, it was his impression that a paper composed of one uniform fibre would be desirable, so that there should be no mechanical differences of texture. If colour were of importance, they could give just the same tint as the French papers. What he wanted was, however, information of the exact requirements of the photographer, and he could assure them English makers would not be left behind in the production of all that was necessary.

Mr. Shadbolt referred to the preseuce of metallic spots as one of the great evils to be got rid of.

Mr. Malone had investigated the cause of these spots, and ascertained that they proceeded from pins, buttons, &c., remaining in the rags, as the makers stated that it would not pay to pick over every inch of rag. He had no wish to discourage Mr. Busbridge; but it was important that he should know that he would have to enter into a vast number of experiments, as there were other considerations beyond the mere production of a good uniform texture of paper, such as the iufluence on toning of different-sizing agents, &c. He thought it right to say, also, that if they as photographers assisted a maker with information as to what was wanted, he must be perfectly open in return, and have no trade secrets in the matter. He must be content with the advantage of having first hold of the market.

Mr. Busbridge said, that for photographic purposes they could give the necessary care to pick over the rags. so that there shold be no metallic particles. He was fully prepared to enter into the subject with spirit, and would esteem it as the blue ribbon of the society to succeed in producing what was required. Nothing would repay him so well, not even £ s. d., as the knowledge that he had fully succeeded in meeting their requirements.

Mr. Sebastian Davis thought it would be a valuable plan of taking advantage of Mr. Busbridge's desire to aid them, and enable them to give the best information to that gentleman, if gentlemen interested in the matter were supplied by Mr. Busbridge with samples of paper made from the most delicate linen rags, one without any size, one sized with starch, and another with gelatine. These could be printed and toned, and their results compared.

Mr. Fry suggested the importance of producing, if possible, a paper with sufficiently fine surface to render albumenizing unnecessary.

Mr. Thomas referred to the mordants used by paper-makers which might be injurious, as alum for instance, which contained sulphur, or at least sulphuric acid. They might be introducing the elements of decay into their pictures when they least expected it.

Mr. Busbridge said, that alum had both a preservative and a destructive action. Gelatine size would decompose if no alum were used, and it decompased if excess were used. He thought that probably the use of a pure gelatine size, and a very small quantity of alum would be found to answer the purpose of photographers.

Mr. Thomas referred to a formula for sizing given in "Ure's Dictionary," consisting of twelve parts of starch, and one part of resin dissolved by means of soda.

Mr. Malone thought they could not too emphatically admit that they were quite in the dark on this question. He remembered that in former experiments it was found that in some prints the size was not readily dissolved out of the paper, and these were found most permanent. It might be that this was due to the effect of alum, and it might he that they would require its operation. At present they did not know what that operation was; but it was by no means clear that it was injurious. Whatever size might be used, he was of opinion that better results would be obtained by introducing a portion of it into the pulp itself, so as to get a clear transparent texture right through as well as on the surface.

Dr. Diamond referred to the use of hyposulphite of soda in the manufacture of the best class of papers.

Mr. Busbridgr said, its use was by no means necessary or common. It was the exception, not the rule.

Mr. Malone said, that when he was on a visit to one of the Maidstone mills, he asked of what they made their paper, and was told of nothing but good rags and fresh hoofs for sizing. He received that statement in good faith; but as he had recently read in the *Comptes Rendus*, that sulphito of soda was used under the name of "anti-chlor.," to neutralize the action of the chlorine used in bleaching the paper, during the course of his visit he asked the question, if sulphite of soda were ever used, and it was then admitted it was, notwithstanding the former statement, that nothing but rags and fresh hoofs were used.

Mr. Busbridge remarked, that it was quite possible Mr. Malone was answered in good faith. He asked what they *made* their paper of, and it might never occur to them to speak of a chemical used for a specific purpose, but was not part of the manufacture of the paper. However, it was not necessary, and he would promise them to make a paper in which it should not be used. They should have a pure pulp made from a single fibre.

Mr. Heath thought it was a very satisfactory thing to know that an English manufacturer would undertake these experiments, and thought they might look for very satisfactory results. He had been deeply interested in reading the paper read by Mr. Hughes at the last meeting, and could not but think that he had struck a chord, which it would be well to sound at all times and seasons. He referred chiefly to the admitted negligence and carelessness in printing generally. It was not possible that greater injustice could be done to negatives than they had frequently received, and he believed that few persons were aware of the real capabilities of their negatives because they entrusted them to other people to print. Speaking for himself, he had sometimes taken many proofs before he discovered how good a picture a certain negative would yield. He was convinced that if the desire were once established to obtain all from a negative which it would yield, the custom would cease of giving negatives to persons who print by the acre. He wished it were well understood that there was such a thing as *cheapness* in printing any more than in any other department of the art. In regard to the question of permanency he had prints done by all processes, which remained permanent, and he now produced some prints from the "Pencil of Nature," which were done in 1845, and only one of them was at all faded and that only at the edge where it was mounted. Still he preferred the alkaline toning process. They knew better what they were about with it, and had the toning more under command. He used chloride of barium as the salting agent, and preferred it because of the warm tone he obtained with it, because he thought less was lost in the toning than when other chlorides were used. He used Saxe paper. He concluded by urging the importance of care in printing throughout, and especially in washing.

Mr. Malone, referring to the pictures from the "Pencil of Nature," remarked that in the one which had faded at the edge it was not the mounting which had caused that fading, but simply that the edge was first attacked by the atmosphere. These pictures furnished a singular illustration of how little was understood of the causes of permanency. They were printed in 1844, and had most of them remained permanent, and yet they only received about half an hour's washing. After fixing each print was put into a pan with two gallons of water, and about 25 prints would be washed in that water. After remaining about ten minutes in the first pan, the print was removed into another similar pan, and in ten minutes more to a third; each print in succession, until tho whole 25 were completed. So that six gallons of water washed the 25 prints of the size 9×7. That some portion of hyposulphite of soda remained in them there could be no doubt, as they toned darker when a hot iron was passed over them; and yet many of them were good now. It was a great misfortune, but the simple fact was we knew very little about it; we did not know to this day of what the image was formed, whether of metallic silver entangled with the fibre of the paper, or of suboxide of silver with organic matter. Knowing so little of what the picture itself really was, it was not surprising we knew so little of the sources of permanency or fading.

The Chairman thought the causes of many photographs fading was the culpable negligence and carelessness with which they were kept. He thought if tho same care were bestowed upon them as upon valuable drawings, tho cases of fading would be less frequent.

Mr. Davis asked if these pictures were printed by direct sunlight or diffused light, as he had an impression that direct sun-printing was favourable to permanency.

Mr. Malone said they were printed indiscriminately with just such light as the day might present.

Mr. Fry, referring to the difficulties experienced by some with the alkaline toning bath, remarked that different samples of paper required different treatment, and that the different formulæ, such as the use of the acetates, posphates, carbonates, &c., with the gold, offered facilities for this different treatment. He thought that every variety of paper would tone by one or other of theso formulæ. There was, however, another difficulty which printers had to deal with, and that was weak, poor negatives. In some cases it was utterly impossible to get a presentable print from some negatives without using the old bath, and he thought when reasonable care, and Lake Price's formula was used, permanent prints might be obtained.

Mr. Eliot stated that when using the alkaline toning bath with one sample of paper, he was unable to get anything but the most unsatisfactory results, until he tried the addition of citric acid, when the prints were immediately rich and brilliant. Subsequently on trying another paper, the *Rive* paper, he was compelled to abandon the use of citric acid, as it retarded toning seriously. It was manifestly necessary to adapt the toning formula to the especial requirements of the paper used.

Mr. Hughes was much gratified with tho interesting discussion to which his opening remarks had given rise. The subject was one of the most important and interesting which could come before them; it was impossible to over-rate it. It was the final object of all their other efforts. Photographically, it was the one question of the age; and indeed he did not think it was saying too much to remark, that he thought they could get up a case for a royal commission to investigate, with much more reason than existed for many such commissions. He had hoped to have elicited many more comparisons of practical experiences; the inquiry had, however, risen to a higher and more important issue, namely, the investigation of what he had become more convinced was at the bottom of all their troubles—the original nature of the paper itself. They had hitherto known nothing at all about it; and if the papers of foreign makers had in many instances answered their purpose best, it was not because foreign makers had listened to their requirements and met them; it was simply the accident of their peculiar method of manufacture. We had now, however, for the first time, the offer of assistance from gentlemen competent to deal with the question of the primitive paper itself. He had attempted to albumenize all kinds of papers, German, French, and English; he had prepared them and treated them throughout exactly in the same manner, and had obtained results the most dissimilar, all arising from the character of the primitive paper. The printing troubles have been unquestionably increased by the process of alkaline toning, and that simply because it more readily revealed the native badness of the paper, whilst the old process more frequently ignored it. But they had been dealing throughout with what they scarcely knew anything about. They talked of *Saxe* paper, but they really did not know what it was; of *Rive* paper, and they scarcely knew whether that was the name of a maker or a place, or indeed scarcely what it denoted, whilst some fancied it was something made within a few miles of London, and so called merely to deceive. Mr. Fry had referred to the influence of the various organic salts in toning different samples of paper. This was a question which, as yet, had received very little attention, and he would commend it to the consideration of intelligent printers to try the respective effects of the tartrates, the oxalates, the formiates, as well as the citrates and acetates, and the hundred other organic salts in connection with gold, in toning different samples of paper. Some allusion had been made to the fact that some prints by the old processes did stand. That was just one of the subtle allurements of his majesty Sulphur, he did sometimes leave a few safe. He had left some, it seemed, in 1844. And then when any of his votaries began to waver in their allegiance, he cried out in oracular tones, "This print was produced so and so many years ago, and is still unchanged; *therefore*, &c., &c." But examine carefully, and it would be found that whilst that one had stood out of a thousand, the other 999 had gone the way of all flesh, and of all photographs. Whereas, under the happy auspices of gold it would be found that whilst some few, through carelessness do undoubtedly fade, the report of after years would, he hoped, be that out of each hundred at least 90 had stood, and only 10 faded. Their weak point still was hypo. Whilst they fancied they had deposed his sulphur majesty, he still contrived, now and then, to do them a little harm. They used the hypo too often; they changed it too seldom; they were afraid of losing their tones, and thus they unconsciously went back to sulphur toning, again enthroning his mischievous majesty without knowing it. The great point was to get rid, if possible, of hypo as a fixing agent. It was surely possible. It was only the other day that this salt was discovered. Its discoverer, Sir Jon Herschell still lived. It was scarcely to be believed that if that had not been discovered something else would not have been found to take its place in photography; and he hoped to see the day when some other means would be found to dissolve out the chloride of silver from their prints as speedily and safely as it was done from their negatives, and without leaving a lurking danger behind.

The usual votes of thanks terminated the proceedings at a late hour.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held at Myddelton Hall, Islington, on the evening of Wednesday, the 27th ult. Mr. G. SHADBOLT in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. Rodgers, of Montrose; Shepherd, of Aldie; Stone, of Bethnal Green Road; and Scott, of the Priory, Tottenham.

Mr. BARBER then read a paper on "A New Method of Preparing Pure Nitrate of Silver from Metallic Silver Alloyed with Copper." (See p. 112.)

Mr. Barber exhibited specimens showing the nitrate in combination with copper, and after its purification.

The CHAIRMAN remarked, in reference to alleged photographic inaction of nitrate of copper, that he remembered Mr. Burnett had on one occasion made use of the salts of copper for the production of certain tints. This, he thought, showed that it was not wholly without action.

Mr. BARBER had prepared a bath with half a drachm of nitrate of copper present, with the same amount of silver, and then produced a good negative. He thought the action was very slight and unimportant, if it existed at all.

Mr. BARBER then then read some interesting remarks on "The Sources of Organic Matter in the Nitrate Bath." (See p. 113.) These remarks were strikingly illustrated by the production of bottles containing the solutions referred to.

After some conversation,

The CHAIRMAN produced, for the inspection of the meeting, the hydrometers to which he had referred at a previous meeting, as prepared by Negretti and Zambra, for ascertaining with considerable accuracy the specific gravity of a small quantity of fluid. One was for the testing of liquids lighter than water, and the other for liquids heavier than water. For use with silver solutions it would be necessary to multiply the figure registered by 6. A 30-grain solution of silver, illustrating Mr. Barber's experiments, was tested, and and the instrument was found to give exact results.

Mr. C. JABEZ HUGHES then read "Some Remarks on Mr. Cramb's Paper on Testing Used Silver Baths." (See p. 111.) He prefaced the paper by remarking that every gentleman present would bear him witness that the remarks he was about to make were entirely foreign to his usual manner and spirit. He had, however, felt it his duty to offer a prompt and energetic protest against a paper so unusual in character and uncalled for as Mr. Cramb's. If attacks like the one in question were permitted without check and marked censure, they would have the effect of entirely deterring some persons from taking part in photographic meetings. Regarding the subject, he might state that further experiments of a very delicate and satisfactory character were in progress, and were in the hands of gentlemen in whom they all felt perfect confidence, and would be brought under attention at a subsequent meeting. Mr. Hughes then proceeded to read his remarks, which were received with marked sympathy and applause.

Mr. DAWSON said he had intended to have read a paper on this subject, and to have made some remarks on the extraordinary performances of this same Bombastes Furioso of the north, but as Mr. Hughes himself had taken up the subject, he thought he could not leave it in better hands; he would, however, read one or two extracts on some experiments. At the last meeting, after the reading of Mr. Hughes's excellent practical paper, it would be remembered, he (Mr. Dawson) expressed a very strong doubt, founded on theoretical principles, whether even in old paper exciting baths, the hydrometer test would give an approximate estimate of the actual amount of silver present, on account of the large amount of other nitrates necessarily accumulating from the double decomposition. Mr. Hughes replied that such an accumulation did practically take place, but to a very limited extent. Since then, he, Mr. Dawson, had made several very careful analyses of some old baths he had by him. Two examples, with the permission of the society, he would read from his laboratory memoranda. He selected these two because the baths had been long in use, only by himself, so that he knew their history, and they were made from and kept up by pure nitrate of silver. The results he would give were the mean of three analysis, which did not vary more than one-fifth of a grain. The history of the bath analysed was this:—It was an old positive paper bath, about ten months old, and was originally three quarts of a 90-grain solution; kaolin sufficient to discharge the colour as it formed, was deposited in the stock bottle, and allowed to remain; after each occasion of its being used, the flat exciting dish and the drop-catchers were rinsed out with distilled water, which was poured into the stock bottle along with 240 or more grains nitrate of silver; the quantity of solution was now reduced to about one quart. The specific gravity at 60° was 1·152, equal to about 83 grains of nitrate of silver to a fluid ounce. As the temperature was raised, the results were—

Spec. grav. at		80°=1·148=	about	81	grs. of	nitrate to	fluid oz.
"	"	90°=1·146=	"	80	"	"	"
"	"	120°=1·140=	"	78	"	"	"
"	"	140 =1·136=	"	76	"	"	"

The ratio of decrease by increased temperature would perhaps be more uniform if it were possible to perform the experiments with perfect accuracy. In the next experiment he took one fluid ounce of this solution, and precipitated it by pure hydrochloric acid, it yielded 67·2 grains chloride of silver, equivalent to 79·6 grains nitrate of silver present in each oz. of the bath. This showed the specific gravity test at 60°, only gave an error of three or four grains. The filtered liquor on evaporation, and after all the nitric and excess of hydrochloric acid had been expelled, left as residue 7·6 grains, consisting of 5·2 grains soluble nitrate, and 2·4 grains organic matter, apparently combined in some way with carbonic acid—but he did not investigate its nature further. The chloride of silver and residue was, as he had said, the mean of three analyses. The organic matter was the mean of two. A test solution of 66 grains pure dried chloride of sodium in 24 ounces distilled water, shewed always precisely 80 grains to the ounce. This slight discrepancy between the perhaps more exact, but certainly more tedious, process of precipitation by pure hydrochloric acid, and the latter modification of Gay Lussac's method, no doubt arose from the difficulty of expelling all the water from the salt, and of measuring out such a large quantity of water precisely. From the quantity of nitrate of silver added to this bath, and from its frequent use, he should certainly have expected to find a very much larger proportion of other nitrates. The equivalent number of nitrate of soda being 84·97, or, in round numbers, 85, it followed that for every two grains of nitrate of silver abstracted by decomposition, one grain of nitrate of soda ought to be left in the bath. This seemed not to be the case in practice, and although the nitrates must be formed, they were, it would seem, partly retained by the albumen or the paper, or taken away by some means not accounted for. He next analysed an old collodion bath. Its history was this:—It was made about the beginning of June, 1860, of the strength of 35 grains to the ounce—40 ounces being made up, and the bath holding about 18 ounces; it was used occasionally during that month, almost daily during July, and pretty frequently since; it has travelled and been knocked about over the wilds of Scotland; yielded upwards of 200 stereoscopic negatives, and lain for four months in a warm room in an open gutta-percha bath; no water has been added, but occasionally crystals of nitrate as it seemed to require them. The specific gravity at 60° was 1·050, showing about 26 grains to the ounce. The analysis by hydrochloric acid gave 26·5 grains chloride of silver, corresponding to 31·39 grains nitrate of silver to the fluid ounce. The analysis by a standard solution of chloride of sodium showed 32 grains. The evaporated liquid yielded 3·2 grains soluble nitrates, ·9 grain organic matter. This organic matter was so light that after drying it floated in water. Its nature he did not determine. He did not say that these experiments entirely settled the question; but the experiments were performed with great care, and certainly seemed to indicate that for all practical purposes connected with the printing-bath the hydrometer gave a sufficient approximation to correct results. As regarded collodion baths it was admitted the hydrometer was not of much use, as the accumulation of alcohol and ether must seriously affect specific gravity. Even after attempting to expel these spirits by evaporation it could not be relied upon, as they were not so easily expelled as might be imagined. After boiling down a bath on one occasion until it was nearly all evaporated, it still retained the smell of ether. The ether could undoubtedly be driven off; but not until nearly all the water was at the same time evaporated. He repeated again, that these experiments were but the beginning of others he intended to make.

The Chairman remarked that the subject was in good hands, and would be examined in several directions by men who were throughly competent to do it justice. The influence of the coagulated albumen in retaining the nitrates had been suggested at the last meeting by Mr. Simpson, and Mr. Dawson's experiments seemed to confirm the idea.

Mr. Moens remarked that Demetrius Constantine, of Athens, who was a good authority, constantly used the hydrometer.

Mr. Hughes said he had placed in Mr. Dawson's hands portions of some of the baths which Mr. Cramb had tested. Mr. Dawson knew nothing of what they were, nor whose they were, so that the results which he arrived at could not be influenced by anything that had been already done.

A conversation then followed on the manifest temper shown in Mr. Cramb's paper, after which the subject dropped.

The Chairman called attention to a reproduction presented to the society's portfolio by Mr. Lander.

Mr. Mainwaring offered to the society for the portfolio, a series of very fine photographs of prize flowers.

The remainder of the evening was employed in the nomination of the various officers and gentlemen of the committee for election at the general meeting next month.

After the usual votes of thanks the proceedings terminated.

City of Glasgow and West of Scotland Photographic Society.

[We extract the following from the organ of the society. We may remark that we are a little puzzled to understand from the reports the exact tone of the proceedings, as in the last report Mr. Stuart is described as expressing the highest satisfaction with Mr. Cramb's experiments, whereas we find the same gentleman at the adjourned meeting denying the accuracy of the report, and prepared with a series of carefully conducted chemical experiments in refutation of Mr. Cramb's experiments.

An adjourned meeting of this society was held on Thursday evening the 14th ult.,—Mr. J. Stuart, one of the Vice-Presidents, in the chair.

The Secretary read a letter from A. Claudet, Esq., in reply to the intimation of his having been elected an honorary member of the society.

Mr. James Cramb then read some "Notes on the Hyposulphites of Silver," and illustrated his remarks by the performance of some experiments.

Mr. Stuart then left the chair for the purpose of joining in the discussion on the hydrometer silver mèter question, adjourned from last meeting. Mr. Duncan Brown occupied the chair during the rest of the evening.

Mr. Stuart reported the results of some experiments made by himself and Messrs. Kibble and Macnab on one occasion, and by himself and Messrs. Macnab and Bowman on another occasion. He (Mr. Stuart) said they had not adopted the plan pointed out by Mr. Cramb of testing the bath, but had taken the true chemical plan of converting the whole of the silver in the baths into the chloride: and to prove the perfection of their analysis they had also made some nitrate from known pure silver. His own bath, they found by their plan of testing contained 88 grains of nitrate; Mr. M'Farlane's 92¼ grains of nitrate; Mr. Macnab's 36¾ grains of nitrate to the ounce. The argentometer obtained from Mr. Spencer, at 60° temperature in a standard solution known to contain 47½ grains to the ounce, stood at 44, or 3½ grains to the ounce of error. In a 30-grain standard solution it was quite correct. This meter indicated 92 grains in Mr. Stuart's bath, and 99 in Mr. M'Farlane's. He (Mr. Stuart) said he mentioned the bare facts—they could draw their own conclusions. On the question of temperature he had to report as follows:—The argentometer showed a variation of 1½ grain to the ounce for *ten* degrees of rise of temperature from 60° to 70°, and from 70° to 80°.

Mr. John Cramb said he would, with the leave of the meeting, attempt to show how much Mr. Stuart's facts proved in this question. He would first correct an error Mr. Stuart had evidently fallen into. The plan of analysis pursued by Mr. Stuart and his friends had been pointed out in his (Mr. Cramb's) paper read at the previous meeting, and the phrase, "true chemical plan," seemed to him simply absurd—as it was quite as consistent with the principles of chemistry to estimate the amount of silver in a solution by the amount of chloride required to precipitate all the silver, as to weigh the amount of chloride precipitated, and so judge of the quantity of nitrate of silver contained in the solution tested. The objection to the later plan was pointed out at the last meeting—its impracticability for photographers in their daily practice. He would beg the members to observe that the results obtained by Mr. Stuart and his friends were thus far confirmatory of the results laid before the society at the last meeting—that in all Mr. Stuart's trials the result was higher, and in a pretty constant ratio, which would lead him to suspect some constant source of error, either in the instruments employed or in the manner of using them. He (Mr. Cramb) at this point insisted on the injudiciousness of citing Mr. Kibble as a guarantee that all had been correctly done. Mr. Kibble was not present, and he, for himself, would not care to animadvert on the statements of a gentlemen which they only had at second-hand.

Mr. Cramb was proceeding to comment on the statements of Mr. Stuart on the effect of temperature, made at the last meeting and in his present report, when Mr. Stuart denied the accuracy of the report, attributing to him to have said that a difference of *one grain* of silver of error to each *degree* of temperature above or below 60° would be indicated by the argentometer.

Mr. Cramb, as secretary, appealed to the meeting whether he had not given a correct report, and it was unanimously declared to be correct.

Mr. Stuart had not said it was a grain to the ounce.

Mr. Cramb said Mr. Stuart was on the horns of a dilemma: his choice was the longest and the sharpest horn.

Mr. James Cramb, pointing to the argentometer said to have been used, remarked that it was impossible to measure half-grains by such an instrument; and, as it had been confessed to be inaccurately divided, he was astonished that gentlemen would use such an instrument in any careful investigation. He simply wished to say further, that the grain and a half per ten degrees of additional temperature, though far below Mr. Stuart's former estimate, was yet much in advance of truth; but in such a matter he would rather show the society the result than tell them of what he had obtained by himself.

Mr. John Cramb said the results given by Mr. Stuart on the specific gravity question were utterly valueless: he (Mr. Stuart) had not tried the bath, except by a hydrometer which he himself had said was erroneously graduated. Why not take the specific gravity bottle, as his (Mr. Cramb's) brother had done?

Mr. Macnab referred to the fact that they made their nitrate from pure metallic silver.

Mr. James Cramb asked how much solution was operated on from each bath?

Mr. Stuart said one ounce of each.

Mr. James Cramb asked what kind of measure they used in measuring the quantity?

Mr. Stuart held up a common conical two-ounce measure.

Mr. James Cramb said it was unwise to talk of careful analysis, and use such a measure, where, from the extent of surface, error would be so imminent. He considered the whole affair as unreliable, and totally unworthy of any one making pretension to scientific accuracy. Analytical chemists used an accurately graduated measuring bottle, which he described.

Mr. John Cramb said he thought it would have been courteous if he or his brother had been invited to be present at the re-testing of baths which they had tested; but as the gentlemen who had reported the results that evening had not thought so, and as the subject seemed by their statements not so satisfactorily settled as it could be, he would propose that the society appoint a small committee to investigate fully the whole question. He still thought it a very small matter, and unworthy of the whole society spending an entire night upon it again; but a report by a committee would not take up much of the society's time.

Mr. Ewing said he thought that the subject had been sufficiently discussed, and he would move that it be now dropped.

Mr. A. Robertson seconded Mr. Ewing's motion.

Mr. Cramb's motion for a committee failed for want of a seconder.

A short discussion followed on the graduating of dropping tubes, &c.

Chorlton Photographic Association.

The ordinary meeting of this Association was held on Wednesday the 13th ult.,—Mr. W. Griffiths in the chair.

As there was no paper, the proceedings were of a desultory and conversational character.

Mr. Wardley said, in answer to a question on transparencies, he was decidedly in favour of taking them by contact on dry plates with artificial light, he had invariably found that pictures taken on wet collodion were wanting in that sharpness and definition which printing by contact on dry plates always gave. Any of the numerous dry processes might be used, but he gave the preference to the raspberry syrup, because the tones produced by it were agreeable and pleasing when viewed in the stereoscope, and also because the beautiful softness and semi-transparency of the shadows which it gave made it particularly well adapted for pictures intended to be used in the lantern; there were certainly the usual difficulties attending all dry processes to be overcome, but they were not such as might not be easily got over by careful manipulation. The principal and only important ones were the liability of the sensitive film to become attached to the negative while in the pressure frame, in consequence of the adhesive nature of the preservative coating; and the next was the tendency sometimes in the collodion to split up or leave the glass during the development or the subsequent fixing. The first might be readily avoided by well drying the sensitive plate before putting it in the printing frame; and the second could generally be overcome, if not entirely obviated, by coating the plate, either wholly or partially, with albumen or gelatine, previous to the application of the collodion.

The Chairman thought that such a use of it must inevitably lead to a discolouration of the bath.

Mr. Hooper said, from the slight experience he had had of it, he was inclined to the view that no deterioration of the bath took place.

Mr. Wardley said it was impossible to use albumen in the manner stated, or even to the extent of a quarter of an inch all round the edge of the plate, without the sensitive bath becoming after a time discoloured and unfit for ordinary wet negative pictures. The coating with gelatine was not liable to the same objections, but greater care was necessary in their preparation, particularly as respects keeping them free from dust and damp.

The Chairman said he did not altogether agree with Mr. Wardley, that the best mode of taking transparencies was by contact, and not through the camera; he believed that, by proper arrangement of lenses and stops, the latter method would be found to present fewer difficulties, with results equally satisfactory as respects sharpness and good definition.

A lengthened discussion then took place on the toning of positive prints by the alkaline chloride of gold. After which

The Chairman made some observations on uranium printing. From the permanency as well as the occasional beauty of its results, he thought a great deal more might be made of it than had been hitherto done. He then exhibited some prints taken by him soon after the process was made public, all of which, he said, remained as perfect in tone as when produced

After some further discussion, the meeting concluded.

Newcastle-upon-Tyne and North of England Photographic Society.

The regular monthly meeting was held on Friday night, 1st inst., in the Tower, New Bridge Street, Mr. G. C. Warren, one of the Vice-Presidents, in the chair.

As a part of the preliminary business, the Chairman read a list of new members who had been elected since the 21st December ult., and were as follows:—The Right Hon. Sir Frederick Pollock, Lord Chief Baron, and President of the London Photographic Society (patron); Right Hon. T. E. Headlam, M.P.; Sir David Brewster, Principal of the University of Edinburgh; the Rev. J. C. Bruce, A.M., LL.D.; the Rev. John Lockhart, A.M., D.D.; A. H. Wall, Esq.; F. Joubert, Esq.; Thomas Sutton, Esq., A.B.; T. Ross, Esq.; Dr. Hill Norris; G. Wharton Simpson, Esq.; George Shadbolt, Esq.; J. Dallmeyer, Esq.; Jas. Dewar, Esq.; Jos. Watson, Esq.; and David Zenner, Esq., analytical chemist.

An interesting paper was read by Mr. Thomas Davidson, optician, late of Edinburgh, on "The position Diaphragms should occupy in View Lenses." Mr. Davidson illustrated his paper by reference to diagrams, pointing out the correct position the diaphragm should occupy, and showed that the distance a diaphragm should be from the lens, to be thoroughly effective, should be regulated according to the size, aperture, and the focal length of the lens. The larger the diaphragm used, the nearer it should be placed to the lens; the smaller, the further from it. Some opticians, he stated, have their diaphragms to slide or turn round in front of the lens, and at equal distances from it, whatever the diameter of their aperture. The impropriety of this was pointed out by reference to the diagrams. It was also shown that, by attempts to secure flatness of field, distortion of the image was produced, particularly towards the margin of the picture, the parts there being enlarged disproportionately to the centre.

At the close of the lecture a conversation ensued, when

Mr. Warren introduced two views of the interior of Whitfield Church, and remarked that when first printed they were so much overdone as to appear quite useless; by immersing them in tolerably strong ammonia, they were considerably reduced in intensity, but had a very unfavourable appearance, being very flat and mealy looking. However, on toning them in the alkaline gold bath, to his great surprise, they became good vigorous impressions.

Mr. North laid upon the table three very beautiful photographs, two of them copies from old sepia drawings taken 150 years ago, one of the old Norman Keep, Newcastle-upon-Tyne, and the other the interior of its chapel; these he presented to the portfolio of the society.

A good display of large photographs and stereoscopic pictures, accompanied by stereoscopes, were placed on the table by the members.

Several fine transparent slides were shown by Mr. LAWS, and were much admired. Mr. Laws kindly promised, at a future meeting, to detail the method he employs for their production, and which, from what was gathered in conversation, appears to have some points of novelty about it.

Illuminated transparent slides were also shown by Messrs. Willis and Anderson.

Votes of thanks were given to the lecturer and chairman, also to Mr. North for his present.

The tannin and albumen process will be brought before the next meeting, on the first Friday in April.

Photographic Notes and Queries.

WAXED-PAPER PROCESSES.

SIR,—I would strongly recommend your correspondent 'Aer" to make himself familiar with the ordinary waxed paper process in its simplest form, before trying the turpentine method. I have obtained very good results using the formulæ given by Mr. Crookes in a little pamphlet published by Chapman and Hall, about four years ago, entitled "A Hand-Book to the Waxed Paper Process in Photography," by William Crookes. This process seems to me much the best for an amateur whose opportunities of practising the art in the field are few and far between. The turpentine waxed paper process is, I think, less convenient because the sensitizing, exposure, and development must be done the same day to make sure of good results, (this, at least, is my experience,) which, in many cases, turns what should be an exquisite pleasure into an arduous toil, whereas the ordinary waxed paper, when sensitized, will keep several days,—a great advantage. My general practice is, to sensitize one day, expose the next, and develop on the third; this is the safest plan as a general rule, but the paper, if well prepared, is quite good at the end of a week after sensitizing, and may be exposed at any time during this period Nothing more definite can be said about keeping, as so much depends on the washing after sensitizing, and the temperature of the weather. Time of exposure again is a point which does not admit of any rigid rule being laid down respecting it. With common waxed paper and a lens that I had not used before. I would allow six minutes for a building well lighted, and at least eight for a near view containing foliage. The two results compared, would be very instructive. It is well to bear in mind that *under* exposure is the fault most generally committed. There seems to be a sort of instinct in exposures for all processes; the operator *feels* that he is doing right, but is quite unable to explain why it is so. The greatest nuisance connected with the Waxed-Paper Process seems to me to be the badness of the Waxed-Paper sold at the shops, I have tried most of the best houses in London, and paid all prices, meeting with the same vexatious results of bad paper, and in answer to my complaints I am always told that there is so little demand for the article that it is not worth while to spend much pains on its preparation. Wax your own paper, say some—but where can you get pure wax? I should be much obliged if some correspondent would instruct me how to extract the wax from the comb, and render it available for photographic purposes.

Yours very truly, A WAXED-PAPER MAN.

TURPENTINE WAX PAPER PROCESS.

SIR,—Seeing a few enquiries *re* Turpentine Wax Paper in the last number of the NEWS, I would in reply, strongly advise him not to try the process without the second iodizer, on account of the length of exposure required; let him omit the eggs in the second solution, and use about double the quantity of iodide of potassium recommended in the work to which he refers.

1. It seems to give better negatives.
2. Two years *or more*.
3. From ten to fifteen minutes, a picture exposed a few minutes more or less makes little difference except in the development.
4. Decolourize with a weak solution of salt water (say half-an-ounce of a 4-grain solution to 12 ounces of bath).
5. If kept between blotting-paper so as to exclude air 14 days.
6. English paper won't do, use Saxe.

"Aer" will find no difficulty in working the process out, *provided* he keeps the developing dishes, &c., thoroughly clean.

Yours truly, T. W. P.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 6*th March*, 1861.

A new process of engraving, termed *Chrisotipy*, has been invented by M. Firmin Didot, the object of which is to transform a plate engraved in the ordinary manner (*en creux*) into a relief, in which the subject can be printed on the usual printing-press, or, as it is usually termed, surface-printed. The process is as follows:—On a steel or copper-plate, covered with the usual engraver's varnish, the subject is engraved with the burin in the usual manner; when finished it is placed in a bath of acidulated water, composed of water five-tenths, nitric acid four-tenths, and sulphuric acid one-tenth—to which a small quantity of sal ammoniac is added. When the plate is sufficiently bitten-in it is removed from the bath. The depth of the lines should be uniform, and the covering of such portions of the design as are required to be more or less dark with varnish, as in mezzotints, should be avoided.

This first biting-in terminated, the varnish is removed from the surface of the plate, then a coating of gold is applied all over it, on the engraved side, either by the electrotype or by other process of gilding.

When gilt, the lines of the engraving are filled with a varnish which is not attacked by acids: this varnish is composed of wax, resin, and engravers' ordinary varnish, and must be applied over the entire surface of the plate, by heating the latter so as to cause the varnish to melt. After removing with a scraper all the varnish from the surface of the plate so that none remains except in the lines of the engraving, those parts of the surface which are covered with gold, must be rubbed with pumice and charcoal, leaving the lines intact, so that after this operation is completed no gold remains on the surface of the plate, except in the incised lines protected by the varnish, the other portions of the plate being now denuded.

The plate is again placed in a bath of water acidulated with nitric acid, with the view of biting those portions of the plate which are now unprotected with varnish or gold; it results that at the end of a certain time, the lines which were sunk below the surface of the plate become in relief, and that the parts which were in relief, on the contrary, are now *en creux*. The second action of the acid bath must be three times as long as that of the first, the lines originally sunk in the plate will then have a relief twice as great as their original depth. On removing the plate from the bath, it is warmed and the varnish rubbed off

White wax dissolved in benzine presents a useful coating for implements or tools of iron and steel, to preserve them from rust. At ordinary temperatures 1 part of wax dissolves in 15 parts of benzine: the solution is applied with a soft brush, and the benzine quickly evaporating, leaves an extremely thin but uniform coating of wax, which effectually protects the metal even from acid vapours. It also possesses a superiority over other varnishes in being elastic and in not cracking.

If a varnish free from tackiness could be obtained from caoutchouc, it might prove useful either alone, or mixed with resins in protography. When dissolved at ordinary temperatures, in benzine, the mixture being frequently shaken, the gelatinous caoutchouc i for the most part dissolved. The solution is not so fluid as benzine, but upon leaving it to repose for a time a perfectly limpid solution may be obtained. The insoluble flocculent deposit may be separated by passing the solution through fine linen under pressure. This solution will mix with oil or spirit varnishes. If properly dried it possesses no gloss, if unmixed with resinous varnish. As it is quite colourless it is well adapted to the varnishing of maps, engravings, &c.

Talk in the Studio.

The Photographic Exhibition.—The Exhibition will close about the end of the present month. The attendance has been, we believe, unusually good.

The Panoramic Lens.—Mr. Ross is, we understand, progressing with the manufacture of panoramic lenses with every prospect of success. Two or three first class photographers we understand have ordered them The manipulatory difficulties in working curved glasses are much less than might be expected. A few days ago, in the laboratory at King's College, we saw Mr. Sutton coat, with collodion, several curved plates, 16in. by 6in., as easily as flat glasses, and without spilling a drop or forming a ridge. We anticipate that fine results will be produced during the coming summer.

Garibaldi's Son.—A contemporary publishes the following: Mr. Stortz, photographic artist, Liverpool, has just received the following characteristic note from the regenerator of Italy. Garibaldi has a son being educated near Liverpool, and Mr. Stortz forwarded to the parent a beautifully-executed portrait of his boy, finished in water-colours :—Mr. Stortz, Liverpool,—I am extremely grateful to you, kind sir, for the agreeable present made to me of the portrait, in water-colour, of my Ricciotti. Thus we have now in our family an absentee whom we love. Command, pray, yours, &c., G. Garibaldi.

Caprera, Feb. 4th, 1861.

The Electric Light.—A company is, we understand, forming for the purpose of bringing Professor Way's Mercurial light to a successful commercial issue. Photographers will probably find the light brought more readily within their means when the company have made their arrangements.

Visiting Card Portraits.—We gave, on page 13 of the present volume, in the number for January 11th, a process of intensifying for producing negatives of peculiar delicacy, especially suitable for visiting card portraits, as used by Mr. Lacy of Ryde. We have recently had an opportunity of inspecting a large number of specimens produced by this process, which certainly equals, and in some respects surpasses, all similar portraits we have seen. In a recent conversation with Mr. Lacy he called our attention to a point we omitted to state, and which he regards as of considerable importance; namely, that the negative is dried before intensifying. Some large specimens we have before us show that the process is not less successful on large plates than on small ones.

Turner's "Liber Studiorum."—From an advertisement in another column, it will be seen that the Science and Art Department at South Kensington are about to produce negatives of the original drawings in Turner's "Liber Studiorum." It will be seen that in regard to the printing and publishing the Department are, in this instance, desirous of enlisting the aid of private enterprise.

Photography as a Civilizer.—No expedition of a civilizing tendency is now considered complete without the aid of photography. A portion of the outfit intended for a second Oxford Mission to Africa, was exhibited at the photographic meeting on Tuesday evening by Messrs. Murray and Heath.

Modified Fothergill Process.—Mr. Gabb, one of our correspondents, sends us the following modification of the Fothergill process. As might be anticipated, the plates do not keep well, but are sensitive, and give good vigorous negatives, as is shown by the print forwarded to us. After having sensitized a plate, pour over it the preservative solution completely, holding the plate upon a pneumatic holder. I have generally poured it over twice to ensure the covering of the whole surface—then wash the plate *thoroughly* with a free supply of common water, and set it by to dry, either spontaneously, or by the aid of artificial heat—the latter perhaps the best. The preservative solution consists of—

Sugar of milk	80 grains
Distilled water	9 ounces
The white of	1 egg

The sugar of milk dissolved in this water, the albumen then added and well shaken up with it. I think the plate is most sensitive if this solution has been mixed a few days before use. I first of all tried sugar of milk alone. I have since seen that sugar of milk and alcohol have been used by a gentleman in Italy with success. I have not tried it with alcohol—but with the albumen in the proportion above mentioned the plate is very sensitive and manageable. The development is with pyrogallic acid and silver in the usual way.

To Correspondents.

Susanna.—Marine glue is the best cement for glass. You will obtain suitable paper of any respectable dealer, but we cannot mention names.

J. P.—We suspect a little gold has, by some means, found its way into your bath. Your best plan now will be to render the bath alkaline by oxide of silver, and then placed in sunlight for a while. Then filter, and if necessary add a minute portion of nitric acid. This method often cures a bath into which some unknown foreign matter has found its way.

Stereo-Cam.—The front lens of a portrait lens, properly stopped down, will often give very good landscape results; but not always so good as a lens made expressly for the work. 2. A twin-lens camera by all means: a single lens for stereoscopic purposes has numerous disadvantages, as you cannot take moving figures; and when the pictures are not taken simultaneously, they frequently have different effects of light and shadow. 3. The maker you mark H we think decidedly the best, as well as a little lower in price. The new stereo lens you refer to, is, so far as our experience goes, the best lens in existence for the purpose. Rack and pinion adjustment is not necessary; indeed in twin-lens cameras it is troublesome. It is better to focus from the back. A certain amount of decomposition has probably taken place in your plain collodion. Add from half a grain to a grain of a bromide to each ounce when you iodize it.

Tit Tat To.—The collodion you mention is, we believe, iodized with cadmium; and, as in evaporating it, you lose the ether first, you will probably very soon get it into gelatinous unmanageable condition. The best means of obtaining more body is to add a grain or two more soluble cotton to each ounce. Evaporating will not injure the sensitiveness. You will find it a good plan to mix a little of some collodion having more of the organic element. You may intensify a negative after fixing by pouring a portion of a five or ten grain solution of silver over it, and then develope again with pyrogallic acid. It is important, however, that the negative possess sufficient detail, or hardness will be the result. You will find an excellent intensifying process in the Photographic News Almanac for this year. 3. The objection to the old hypo-toning bath to which you refer, does not arise from any difficulty in getting good tones, but from the want of permanency in the results. It is not necessary to change the bath, but take care to keep it quite free from acidity; and it is well to finish with a few minutes in fresh bath of new hypo, saturated solution. You had better try the alkaline gold bath, if you desire permanency.

W. L.—The aceto-nitrate bath, used for the albumen plates, will occasionally require decolourizing. Citric acid, as recently described by Mr. Tunny, will be bettter for the purpose than kaolin. Liver of sulphur can be had of all respectable photographic chemists. It is not a pleasant-smelling article.

W. A. S.—With a bright light and sensitive plate instantaneous pictures may be taken with landscape lens; but a suitable double combination is better. 2. There is no objection whatever to white for outside of developing boxes, &c.; but, in hot weather, a positive advantage. It is not necessary to be a member of any photographic society to be enabled to send pictures to the Exhibition.

R. N.—We think that photography may be made very valuable in connection with hydrography, and shall be glad if we can aid you in its application. The use of bromized collodion and iron development, together with a good lens will enable you to photograph headlands, &c., from the deck of a ship under weigh, provided the light be good. 2. You will find an articles on Instantaneous Photography in the Photographic News Almanac for this year, and inseveral numbers of the News. 3. You will, we think, be able to get the bellows portion of a camera from a respectable camera maker. See our advertising columns. 4. The market for photographs would depend as much on the picturesque nature of the scenery and the excellence of the picture, as upon the scene being remote and little known; but we should imagine that Africa and South America, would furnish subjects full of beauty and interest, and if well executed and of a large size would sell. It is probable that good pictures of some of the largest ships would sell. For these probably stereoscopic pictures would be desirable. We are generally at the office on Thursday afternoons, but uncertain at other times. We shall be happy to see you if you can call.

A. H. S.—There does not seem to be anything amiss with your waxed paper. You do not state exactly what your difficulty is. Remember that especial cleanliness is necessary, especially in regard to the dishes. We see no reason why you should not succeed with the resin process; but you will ascertain best by trying.

Seaside.—We answered your question a few weeks ago. The Exhibition closes at the end of the month.

Wm. Bartholomew.—You need not anticipate any bad effects from your method of preserving the gold bath. Your print speaks well for the tannin process. You will get softer results by using a bromized collodion.

Alpha.—It is necessary to be proposed by a member. We will have pleasure in proposing you. The subscription is half-a-guinea yearly.

G. P.—The subject of our correspondent's letter is interesting; but there are two reasons why it cannot be published as it stands. It deals somewhat captiously with the labours of a gentleman who exerts himself very disinterestedly for the public good; and it is anonymous. In a discussion between two persons they should stand on equal terms, which is not the case when one avows himself, and the other preserves himself incognito. We will refer to the subject of the letter in our next.

O. X. X.—You have succeeded well in mounting your lens; there appears no fault with it. Your best plan with your bath will be to follow the instructions given to J. P.

Hy. Cooper.—We are not aware that the details of the especial albumen process used by Messrs. Soulier and Ferrier have been published; but you will find a very simple and efficient method of using albumen for the same purpose in the Photographic News, No. 129, also several articles on the subject in Vol. IV.

C. K.—The raisin extract referred to by Mr. Davis is made by boiling raisins in water. You will find particulars on p. 351 of our 4th vol., or p. 70 of our Almanac. The negatives are very fine: but as yet we cannot say how long they will keep. You may prepare the plates at home by candle light with advantage. Do not work too near the light of the candle; and be careful with the vapour of the ether.

H. S., Phos., N. W., O. X. X., F. Lane, and several other Correspondents next week.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 132.—March 15, 1861.

THE TANNIN PROCESS.

One of the chief features of the new edition of Mr. Hardwich's "Manual," is a new dry process, or modification, the discovery or first application of which is due to Major Russell. The preservative used in this process is a solution of Tannin, which leaves on drying a varnish-like film, not peculiarly hygrometric, or sticky to the touch, but readily softening with water, and affording facilities for quick and easy development. The chief advantages claimed for the process are simplicity of preparation and certainty of result, clean, sharp, vigorous negatives of remarkably good tone being generally obtained.

Mr. Hardwich speaks very highly of the process, and regards it as "most closely allied to wet collodion, both as regards the composition of the sensitive film, and the quality of the picture." Of the operation of the preservative he says:—

"When applied to the surface of the excited film, the tannin keeps open the pores of the collodion, as before described, and the mechanical condition of the film appears to be intermediate between that of Norris's and Fothergill's, being slightly more permeable than the latter, but considerably less so than the former. Independently of this, however, tannin has a very remarkable effect in *stimulating* the sensitive iodide, and causing it to take a much deeper and more decided impression in the camera.

"It would not be correct to speak of this acceleration as an increased sensitiveness imparted to the iodide, but rather as an augmentation in the force of development, in consequence of which the image starts out quickly, and with more contrast between the extreme tints; the colour of the image is also different, the particles which compose it being no longer grey and crystalline, but finely divided and opaque, so that the negative possesses all those qualities which the photographer requires,"

Mr. Sutton, who has experimented largely with the process, says he has "very little doubt that the tannin preservative will turn out the right thing, and that this process will quickly supersede wet collodion for all out-of-door purposes, in which rapidity of action is not required." We have been present at many of Mr. Sutton's experiments at King's College, and have seen many very fine results obtained; but from the drawbacks we have there seen, and those occurring in our own hands, we are scarcely so certain of the universal success of the process.

The details of the manipulations are as follows:—The plate is coated with collodion and excited in the usual bath, on removal from which it is thoroughly washed with common water from a tap or jug, to remove as much as possible of the free nitrate of silver; and a final rinse with distilled water is recommended. A solution of tannin, fifteen grains to an ounce of water, is then poured upon the plate. The tannin may be had of any chemist, and is very soluble in water: the solution should be filtered before use. It is recommended to pour on sufficient of the solution to cover the plate, and, throwing that off, coat again, and place the plate to drain whilst another plate is being prepared. After draining awhile, the plates are to be dried by means of artificial heat.

Mr. Hardwich recommends, as a simple drying box, the placing of a heated flat iron on a levelling stand in common deal box, around the sides of which the plates can be arranged and dried in a few minutes: in our own experiments we used the flame of a spirit lamp for drying the plates. The exposure is six or eight times as long as that required for wet collodion plates under similar circumstances. On proceeding to develope, the plate is first moistened with common or distilled water—which is very easily effected, as the film is not repellant of water—and then developed with pyrogallic acid and silver. The strength of the developer may vary with circumstances, but about two grains of pyrogallic acid to an ounce of water is a good strength. To this is added a few drops of a twenty-grain solution of nitrate of silver or citro-nitrate of silver, according to the tone desired. If very black tones are desired, with a slightly purple tone by transmitted light, the latter should be used, one grain of citric acid to each grain of nitrate of silver in the solution should be added. If red tones are desired, acetic acid should be added to the developer in the usual way, about fifteen minims to each ounce of developing solution. The development is not so slow as in most of the dry processes, from three to five minutes sufficing when the plate has been properly exposed.

The collodion should be of the kind usually recommended for the dry processes, giving a powdery, porous film, not contractile, and repellant of water, and we think that alcohol at least in equal proportions to ether should be used in preparing the collodion. Some of the best results we have seen produced by this process have been from plates coated with alcoholic collodion prepared by Mr. Sutton. Either a simple iodide, or an iodide and bromide may be used; but we decidedly recommend the latter, inasmuch, as the tendency of the tannin is to give excessive vigour, and without the use of a bromide this tendency is apt to produce hardness. The collodion we have used for the purpose, and which seemed to possess the right qualities, was made by the formula we have given in our Almanac, which we will here briefly recapitulate:—Pyroxyline of a powdery character and very soluble, five or six grains in each ounce of solvents, consisting of one part ether, sp. gr. 725, one part alcohol, sp. gr. 805, and one part alcohol, sp. gr. 820. To each ounce of normal collodion two grains of iodide of cadmium, two grains and a half of iodide of potassium, and about half a grain of bromide of cadmium. This collodion had been made nearly twelve months, and was as sensitive in the wet process as when first made.

The results, as we have said, are very fine, the negatives being very brilliant and vigorous, and remarkably clear in the shadows, any foggy deposit on which may be rubbed off when dry without injury to the negative. There are, however, two serious drawbacks, which will, we think, materially tend to prevent the general adoption of this process. The first is one common to all processes more or less, if great care and cleanliness be not used, but we think belongs to this process in a pre-eminent degree, at least, so far as our own experiments, and opportunities of observing those of others give us an opportunity of judging: we are referring to liability to stains, this increased liability apparently arising from the fact that tannin is in itself, in some degree, a reducing agent. The necessity of careful and cleanly manipulation, however, would not be an objection in the hands of the clever photographer, if results comensurate with the efforts were obtained.

A more fatal objection exists, however, in the tendency which the film has to leave the plate in the processes of developing, fixing, and washing. This is a defect common, in some slight degree, to many of the dry processes, but in this it seems to exist in a pre-eminent degree, and seems to be the result of some action of the tannin. We arrive at this conclusion from the fact that in some experiments on relative sensitiveness, we simply washed and dried some plates coated with the same collodion as was used for the the tannin plates, and these showed no such tendency in the subsequent washing processes as was manifested by the tannin plates. A collodion adhering with very great tenacity to the glass will doubtless to some extent prove a remedy; but whether the tendency can be entirely obviated remains to be ascertained. Mr. Hardwich has recommended as a remedy—and insists on its importance in large plates—the coating of the glass with a two-grain solution of gelatine, and letting it dry prior to coating with collodion. This would, undoubtedly, largely remedy the difficulty; but it would at the same time materially destroy the especial quality which recommends the process—the simplicity of preparation—whilst it would introduce an element of injury to the exciting bath; so that we apprehend if this gelatine coating be absolutely necessary, few will be tempted to give up dry processes which they have worked successfully, for the use of tannin.

On the score of sensitiveness no especial claims are made for this process. Mr. Sutton states, as the results of his experience, that the exposure required for tannin plates is about six times that required for wet collodion. Mr. Hughes informs us that he found that a tannin plate required seven minutes, and wet collodion one minute, to produce similar negatives with the same lens, light, &c. We have not tested a plate with wet collodion at the same time, but our experiments corroborate these ideas as to the exposure required. Mr. Sutton gives about three minutes as the exposure necessary with a view lens of five inches focus, quarter-inch stop, and a good light. We tried some plates with a Dallmeyer's new stereo lens of four inches and a half equivalent focus and three-eighths stop, and gave a minute and a half exposure. We also tried some plates prepared with the same collodion at the same time, and simply washed and dried without any preservative coating at all, and gave them a similar exposure. The latter, on development, appeared, sufficiently exposed, but thin and weak in the lights, and had a foggy deposit on the shadows. The tannin plates, on development, appeared slightly under-exposed, but were red and vigorous in the lights, and clear and transparent in the shadows. The light was pretty good; but there was no sunshine. If the plates are over-exposed the image is visible when the plate leaves the camera.

The keeping properties yet require testing, but where any long-keeping qualities are desired, it will be desirable to use a dilute salt solution—five grains of common salt to an ounce of water—as recommended by Mr. Hardwich, after washing the plate and before applying the tannin. As all traces of free nitrate of silver will be removed by this operation it will be desirable in all such cases to use a bromo-iodized collodion.

There is one especial use of these plates which we have not mentioned; they are especially suitable for the production of transparencies, printing by superposition of the negative. The rich black tone produced, the sharpness and crispness of detail, and the clearness in the transparent lights of the picture, have much the effect of transparencies on dry albumen plates. About four seconds exposure in the printing frame, to diffused daylight in a room, is sufficient exposure to produce capital results.

Those of our readers interested in the preparation of dry plates will doubtless give this process a fair trial, and we shall be glad to learn the results of their experience to afford opportunity for comparison. So far as we can see at present we are not sure that it promises less trouble in preparation, or better results than the process recently proposed by Mr. Sebastian Davis in our columns, which we will briefly recapitulate: coat the plate with a powdery collodion, containing, in addition to iodides of potassium and cadmium, a small portion of bromide and of chloride of ammonium. Sensitize in the usual way, and on removing the plate from the bath immerse in salt and water, and give a final rinse with distilled water. Then coat with a mixture of albumen and sugar syrup, or raisin extract, in equal parts, to which a few drops of ammonia have been added; after about a minute wash and dry. These plates have a medium degree of sensitiveness, keep well, develope with clean, rich, and vigorous tones, and have no tendency to self dstruction by the film leaving the plate. This appears to be about as certain and simple a modification of the Fothergill process as we have seen.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Background.—A term sometimes used to indicate the sky and distance of a landscape, but more frequently applied to the space which lies behind a picture's principal object, or objects. How often is the threadbare anecdote to be repeated, of the great painter, who told the would-be pupil that if he could paint his backgrounds he could paint his pictures? No one denies the vital importance of a good background, and yet how few ever treat it in any other than a mechanical and conventional method. As to the photographer, his sole aim seems to be that it should be free from spots, stains, and comets, and relieve dark hair with light, and light with dark. A few of the simpler principles which should regulate the choice and management of backrounds may be useful. If you illuminate a sitter—I now refer to portraiture—with a weak light, to secure a powerful effect of light and shade, the lightest portion of the background must be dark enough to give value to the lights of the face, and the darkest portions should not be so dark as to weaken the intensity of the darker shadows, nor so light as to give them a spotty or patchy effect, by rendering them unduly prominent as the darkest parts of the composition. If, on the contrary, you illuminated with a strong diffused light, and obtained a very delicate effect with tender shadows, having powerful reflected lights, a dark heavy background would kill all the beauty and modelling thus obtained, and render the face a mere flat patch of light. Again, a dry, hard effect will arise from having a background which relieves with equal force every part of the figure. An inlaid appearance destructive of relief will arise from a background which exhibits one uniform appearance of texture, and a monotonous evenness of tone and colour; an unpleasant effect will also arise if the darkest or heaviest portion of a background be at its top instead of its base, unless the latter be nearly allied to it in tone, &c. The background should serve, in short, to give force, roundness, and brilliancy to the principal portions of your subject, by the judicious contrast of tones and intensity. White backgrounds, or, in other words, *no* backgrounds exhibit very bad taste. The high lights want brilliancy, because they are no longer the most luminous parts of the picture, huge masses of the same intensity or whiteness killing their force, and effect; the half tints acquire an undue amount of force and so lose softness and delicacy, and the shadows lose transparency. These remarks apply also to those terrible abominations "white skies," or, rather, *no* skies, in which case not only do the lights lose their luminous character, the half tints their delicacy, and shadows transparency, but aerial perspective is quite destroyed, and a flat map-like character substituted for that of space and relief. See *Adhesion.* By the proper placing of a model against the darker or lighter portions of the background, the more beautiful outlines may be rendered prominent, and monotonous, angular, or otherwise objectionable portions lost in a mass of dark. Breadth of effect may be secured by properly managing the lights and darks of the background, indeed when the portrait is a mere bust—or what painters sometimes jocularly call, a cod's head and shoulders—this is frequently the only method of securing breadth of chiaroscuro. Do not get a very dark background to contrast a white dress, as this would render the latter flat and intensely conspicuous; nor for the same reason place very dark drapery against a very light background. A swarthy model in dark drapery must not have a too light, nor a fair delicate complexioned model in light drapery a too dark, background. If you make use of a painted cloth to represent an interior or out-door view, the horizontal line must be at somewhere about the height which your lens is most generally placed at, and the vanishing point nearly opposite the spot occupied by the camera. The lights should be far removed from white. The best plan is to prepare it of a drab ground, and lay it in with different tones of the same or a similar colour, leaving the ground to represent the high lights. Then every part will retire, and the figure before it be in proper relief. If this background be painted in distemper, or colours prepared with size, take care not to use the glue or size in excess, as the colours will then crack and peel off.* A background of this description should be sketchy, faint, and slightly executed. If too forcibly painted, it will destroy the general effect. I have just said that the horizon of a landscape background and the vanishing point should be opposite the lens, I may perhaps for the sake of such operators as are not acquainted with perspective explain why. The figure and the background are supposed to be taken at one and the same time, and the camera has the place of the spectator by whom they are taken. Now suppose we have a real figure before a real landscape, if I look up at a figure I obtain one view of it, but if I look down on it I get another and quite a different view, and the horizon of the natural landscape behind the figure is always exactly the height of my eye. To prove this you may sit down before a window and mark on the glass the height of the horizon, then rise and as you do so you will find the horizon also rises and is again exactly opposite your eye. A picture then in which the horizontal line of the background represents the spectator as looking up at the figure from a position near the base line, while the figure itself indicates that the same spectator is at that identical time standing with his eyes on a level with the figure's breast or chin. Such productions are evidently false to art and untrue to nature. It is hardly necessary perhaps to add that the light which illuminates the sitter should not be in opposition to that by which the landscape is lighted.† A figure which receives a strong direct light from some one comparatively small aperture, giving it the dark and powerful shadows of in-doors, should should not be placed in the full broad light of the open air in which the shadows are weak and the lights diffused. In painting such a background too it is well to concentrate the lighter portions near the centre of the screen: to keep the lights down and to avoid strong shadows; to prevent lines from cutting the space into sections, and the space about the position of the sitter's head clear and free. White and black in contrast are fatal to the proper character of a background, for, as Fresnoy tells us—

> "White, when it shines with unstained lustre clear,
> May bear an object back or bring it near;
> *Aided by black it to the front aspires,*
> That aid withdrawn it distantly retires."

White, however, should be kept entirely out of your background, in order that the high lights of your subject may be luminous and brilliant, as I have before said, for, to quote Fresnoy again—

> "Give then each foremost part a touch so bright,
> That o'er the rest its domineering light
> May much prevail."

The general fault in the painted screens we see behind photographs arises from introducing too many objects. Simplicity and breadth should always be their main characteristics.

Back-painting.—A name given to a method once common with cheap print-sellers of painting mezzotints with varnish colours applied at the back. A good many photographs were once spoiled in the same way; and it is said that some rash individual actually took out a patent for the childish process.

Balustrades.—Frequently used as accessories in photographs, and very useful in posing; but they should be so painted in distemper or turpentine as to prevent glossiness of surface, and not to appear too prominent or light in the photograph. By using silver sand in the flatting, or turpentine colour, an effect closely resembliug that of stoue may be got.

* Four ounces of glue to nearly a gallon of water is about the usual proportion.

† I need only point out the frequency with which this bit of common sense is violated, in the carte de visite portraits, to justify this morsel of advice.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Having given in our last an account of the best method of preparing iodide of potassium, we proceed now to notice the various impurities and adulterations to which it is liable. The commercial salt may contain carbonate of potash, iodate of potash, chloride of potassium or sodium, sulphate of potash, sulphide of potassium, and organic matter containing sulphur. The *carbonate of potash* gives rise to an alkaline reaction in the solution of iodide of potassium, a greater tendency to deliquesce, and occasions an effervescence on the addition of acids. It may be removed by neutralising the alkaline solution with a little hydriodic acid, or by powdering the salt and boiling it for some time in strong alcohol. The carbonate will be left behind whilst the iodide is dissolved. In either case, by filtering and crystalliziug the iodide may be obtained free from carbonate. The presence of *iodate of potash* may be detected dy dissolving in water and adding a few drops of hydrochloric or tartaric acid. If iodate be present the solution will turn brown from the separation of iodine. It may be purified from this by careful drying and then heating to dull redness. After cooling and crystallizing from water the iodide will be found free from iodate. *Chloride of potassium or sodium* may be detected by adding nitrate of silver in slight excess to the aqueous solution, then pouring a little solution of ammonia over the washed precipitate, and testing the filtered liquid with pure nitric acid; if a white precipitate be thrown down it will show that a chloride is present. *Sulphate of potash.*—This impurity may be easily detected by dissolving in water and adding a drop of chloride of barium with some hydrochloric acid. A white precipitate which remaius undissolved in the acid will show the presence of a sulphate. This can be removed by dissolving in alcohol and crystallizing as above directed, the sulphate being quite insoluble in that medium. *Sulphide of potassium* may be detected by adding a few drops of sulphuric acid to the aqueous solution, if sulphide be present the disagreeable odour of sulphuretted hydrogen (rotten eggs) will be perceived. If the presence of *organic matter containing sulphur*, probably xanthonate of potash, be suspected, the iodide of potassium will have a nauseous taste like assafœtida, and will turn greyish brown, with evolution of sulphurous acid, when heated. The residue, treated with water, will leave charcoal containing sulphur, and sulphate of potash will be found in the solution along with the iodide. This impurity occurs when alcohol, together with sulphuretted hydrogen or a metallic sulphide is used in the preparation. A salt containing this impurity or the previous one of sulphide of potassium should be at once rejected, as it would be totally unfit for photographic purposes, and it would not be worth the amateur's while to attempt its purification.

Iodide of potassium is sometimes intentionally adulterated with other substances. The following is a very convenient test for its purity in this respect:—One atom (165·2 parts) of iodide of potassium completely precipitates one atom (136·8 parts) of chloride of mercury from an aqueous solution; but the insoluble iodide of mercury again dissolves completely in one atom of iodide of potassium. Two atoms, or 330·4 grains of the iodide of potassium to be tested, and one atom, or 136·8 grains of pure corrosive sublimate are each to be dissolved in six ounces of water. To two ounces, accurately measured, of the solution of iodide of potassium, the solution of corrosive sublimate is then to be added very gradually until a permanent precipitate begins to appear; if two ounces of the latter solution are required for this purpose the iodide of potassium is quite pure; but if a permanent precipitate remains when only one ounce of the corrosive sublimate solution has been added, the iodide of potassium is adulterated one-half with foreign substances; and if one ounce and three-quarters of the corrosive sublimate are required to produce a permanent precipitate, it will show that seven-eighths of the salt is iodide of potassium, and the other eighth is made up of adulteration.

Pure iodide of potassium has the following properties:—It should dissolve entirely at ordinary temperatures in three-quarters of its weight of water, and in six times its weight of strong alcohol. It separates from its aqueous solution in white crystals, sometimes semi-opaque, and having forms derived from the cube. The crystals melt below a red heat, have a sharp taste, and when dissolved in water turn reddened litmus paper blue. They are not deliquescent except in very moist air. The commercial salt frequently deliquesces owing to the presence of carbonate of potash.

Iodide of ammonium.—This salt may be easily prepared by adding to the solution of proto-iodide of iron prepared as recommended in our last chapter, a solution of carbonate of ammonia, until the liquid after stirring, continues to smell slightly of ammonia. It must then be heated and filtered. The solution on evaporation yields crystals of iodide of ammonium. If the carbonate of ammonia were pure and the iodide of iron prepared with good materials, the iodide of ammonium will be pure, otherwise it will require crystallizing again. It forms small colourless crystals, which are very unstable and apt to turn brown owing to the separation of iodine. The salt is more soluble both in water alcohol and ether, than the potassium salt. Its solution likewise turns reddened litmus paper blue. When colourless, it may easily be kept so by being put away in a dry state away from the light. And if it be brown it may be decolourised by placing it in a small flask and pouring over it a little ether. On shaking, the iodine will be dissolved out and the white salt left behind. The commercial iodide of ammonium frequently contains sulphate of ammonia and carbonate of ammonia. The latter being added to preserve it from changing colour. The best way to detect the presence of these is to dissolve a little of the salt in water, and then to add a clear solution of chloride of barium. If a white precipitate be produced it shows that a sulphate or carbonate is present. Now add a couple of drops of dilute hydrochloric acid, and if the precipitate dissolves with effervescence it shows that carbonate of ammonia was present, while if the precipitate still remains undissolved it indicates the presence of a sulphate. From the latter it may be purified by dissolving in hot alcohol, filtering, and allowing to crystallize; the sulphate being insoluble in alcohol will be left behind on the filtering paper. From carbonate of ammonia the iodide may be freed by dissolving in water and evaporating to dryness on a water bath. The carbonate being very volatile will entirely go off.

Iodide of cadmium is another important photographic iodide, and one which is very easy of preparation. Take some pure metallic cadmium and cut or rasp it up into a coarse powder: then take pure iodine in about twice the quantity of the cadmium. Place them in a glass flask together, and cover them slightly with alcohol. The two elements will combine with heat and the colour of the iodine will soon disappear. When that is the case add water until the crystalline compound which results from the union of the cadmium and iodine has dissolved, and filter from the few grains of the metal which will be left behind. Evaporate the solution over a water bath, and allow the salt to crystallize out. It may be rendered absolutely pure by a second crystallization from alcohol.

Iodide of cadmium so prepared forms large white tabular crystals of a pearly lustre, which do not deliquesce. They are very soluble both in water and alcohol. The only impurities likely to be present are those originally in the cadmium. Of these zinc is the most frequent; its presence prevents the crystals of iodide of cadmium from forming in a perfect manner, and occasions the liberation of iodine when dissolved in collodion.

WOODWARD'S SOLAR CAMERA.

M. Leon Foucault, well known to the scientific world by his ingenious method of demonstrating the diurnal rotation of the earth, has remarked that the discussion between Messrs. Claudet, Bertsch, Moigno, Thouret and others, on the solar camera, rests entirely, like most disputes, upon a confusion of terms. M. Foucault has endeavoured to elicit the source of the confusion. He shows that in Woodward's solar camera the little image thrown on the enlarging lens has never been regarded, as M. Thouret supposes, as an image of the negative to be enlarged; it is a real solar image, formed by the union of all the rays collected by the condensing lens. This condition being satisfied, it is right to maintain that the enlarging lens acts as if it had been contracted by a diaphragm to the diameter of the solar image.

Let, for example, C represent the condensing lens, L the enlarging lens, and E a screen placed at a distance corresponding to the conjugate focus of the plane N, where the negative must be placed. In an apparatus thus arranged, and in the absence of a negative, it is evident that the whole of the light spread over the screen is composed of the same rays which, in the plane of the enlarging lens, group themselves together to form a solar image. This image, therefore, contains in its small area all the light which, further on, is distributed over the surface of the screen. From this it follows that without changing the effect, or suppressing a single ray, we can, by a diaphragm, mask all the zone of the enlarging lens which exceeds the solar image.

If we now proceed to place a negative in the plane N, the glass which supports it having strictly parallel surfaces, the general direction of the rays will not be altered, the solar image will continue to be formed on the enlarging lens; only most of the rays in passing through the various points of the negative will undergo a partial and varying extinction, the effects of which will be repeated on the corresponding points of the image on the screen. In this manner an enlarged image of the negative is formed, solely in consequence of the partial and local extinctions it determines, without at all modifying the geometrical path of the persistent rays.

It is, therefore, reasonable to maintain that in the formation of the enlarged image, the region of the objective lens occupied by the solar image intervenes in an efficacious manner only, that the exterior zone gives passage to an insignificant proportion of the diffused rays, and that, consequently, it cannot impart, through spherical aberration, a faulty direction to the useful rays.

Is this equivalent to saying, that to obtain the best results it is indispensable to receive the focus of the condenser upon the enlarging lens? This is quite a different question. The sole result of the preceding explanation is, that everywhere where the bundle of illuminating rays constitutes an image of the luminous source, we may consider it as passing through a diaphragm of the same form and size as the image. By this simple consideration we easily arrive at foreseeing the part reserved to the various parts of the enlarging lens, whether the solar image be formed on the plane, or before or behind the optical centre.

In making the focus of solar rays fall upon the enlarging lens, it results that only one and the same portion of this lens is affected in the formation of the entire image of the negative, which, generally, is not a favourable condition to equality of effect. On the pretext of avoiding spherical aberration we fall into a graver inconvenience, which consists in a diminution of the field of sharpness. In this consists an inherent defect in the arrangement claimed by Mr. Woodward, and which cannot be considered as a complete solution of the problem of optical enlarging.

It would be preferable, in my opinion. M. Foucault observes, to make the solar image I fall beyond the enlarging lens L, on condition of giving to the latter the form of a meniscus, the concavity of which is turned towards the solar focus. We should thus have a system which operates in an inverse direction to the old camera of Wollaston, adopted by Daguerre.

This arrangement has given good results with a simple lens; but further resources may be found in the use of combination lenses.

AN APPEAL FOR THE PRACTICAL IN ARTISTIC PHOTOGRAPHY.

BY A. H. WALL.*

Gentlemen,—It is with no small pleasure that I respond to the invitation extended to me through the editor of The Photographic News, by placing in your hands the following unpretending paper:—A new branch of art has arisen, to the improvement and advancement of which, this, and kindred associations have been generously devoted. Its numerous applications and their varied character, have procured it admirers, professors, and practitioners among individuals of the most diverse characters, inclinations, sympathies and pursuits. It ministers to the pettiest sentiments of the meanest nature; and it soars above the aspiring ambition of the loftiest; now depicting the simpering expression of personal vanity; now bringing through the measureless abysses of space those mysterious images of other worlds, rolling in silent majesty upon their God-appointed ways. Filling the awe-struck soul of the mightiest astronomer with new thoughts and fresh conclusions, as he compares their invaluable records with those written by the Divine hand high in the mighty dome of the hushed and solemn night; and delighting the illiterate serving-man or maid with a sooty and distorted image of vulgar finery and commonplace features, in a six-penny glass positive, "with frame and glass, with a ring to hang it up by," all included. The mere "man of facts," as he delights to call himself. travelling in his little circle of ideas, with imaginative faculties and poetical sentiments locked up in darkness, and guarded by the stern hard jailor of common-place utility, and selfish advantageousness, patronizes photography; for, says he, "it is uncompromisingly true; it takes my portrait and it gives me the wort on the cheek and the squint in the eye; exactly as I am. It produces me a landscape, and I can count the leaves on the trees, the bricks in the walls, and the tiles on the roofs." Again the poet lover of beauty, worshipping at the shrine of refinement and art, finds in the less common specimens of artistic photography food for the highest thoughts, and sources of the most ennobling emotions. Such is the art we, as members of photographic societies, have the privilege of training through its infancy, and educating for the glorious missions of its coming manhood.

I think it is high time that this young giant, photography, should learn that, apart from its wonderful and invaluable qualities as a scientific agent, and, high above the perfections of manipulatory or mechanical details. which, after all, are but means to an end, it should prepare to take higher rank with the loftiest and most humanizing of intellectual tendencies as *a Fine Art*.

The arts in their highest state of progress indicate the refinement and opulence of a nation, and are then termed fine arts. This term is at present held to include poetry, painting, music, sculpture, and architecture. To this list there is no just reason why we should not add photography, for in whatever way we define the perfection which is understood as constituting the claim of any art to be called fine, our art can show, either that it already has such qualities, or that such qualities are within its reach, or that there is very reasonable hope of such qualities being acquired. In either case there would exist no fair argument against its claim. Every branch of the fine arts were as much fine arts in their infancy as now. else we are without fine arts; the utmost stage of perfection. or the absolutely highest state of progress, being yet unreached in either of the five arts I have named as fine. I therefore think such facts as are mere indications of the infantine state of photography should not be advanced as arguments against its rightful claim to so honourable a position.

To enforce this claim we must look to our practical operators. The evidence of the eye is better than that of the ear. One member of this valuable society, in bringing forward a single production expressive of real artistic power, sentiment, or feeling, would find in its silent eloquence a more able pleader for the recognition of his art's high value, than a whole army of such poor advocates as you now honour with your attention.

Believing this, I have always, when speaking of art in connection with photography, endeavoured to give my remarks some *practical* value; confident that in calling attention to the more simple or mechanical of pictorial principles, I should have the better chance of enlisting in the cause such allies as would do battle for it with their chemicals and apparatus, rather than with their pens or speeches. Not that I undervalue the æsthetical in art, or think feeling, imagination, or sentiment of less value to the photographer than to the painter; but because I know that the lesser must precede the greater; the seed the harvest. There are those who think the corn already ripe; but they are not many. There are others who believe the soil to be barren ground in which such seed can never grow; these are more numerous. The fact is, the ground is new and strange; *has been neglected, and contains some weeds;* but only requires our operators, societies, and journals, to put their hands to a plough already in the furrow. To do so we must endeavour to urge upon our operators the importance of a practical acquaintance with the rules of art.

There is plenty of art in the *mouths* of our photographers, but there is very little of it, as a rule, in their works. Like Hood's poor fellow who, with victuals always in his mouth, sadly wanted a belly-full. Loose talk about art has never been a very scarce commodity, I'm afraid, but it has certainly always been a mischievous one. With no other aid than a good memory, you may *talk* art or poetry by the hour, but to *feel* either, you must do more—you must *understand* it. It is only those who feel art whose works display genuine pictorial excellence; and it is seldom indeed that any feel art who do not also understand it, even although they may be by no means eloquent in giving to such knowledge verbal expression. The importance of this suggestin may be found in the character of this year's critiques upon the Photographic Exhibition in London.

I have just been reading a series of remarks in some daily and weekly papers. Nearly all of them, directly or indirectly, denounce its claims as a fine art, and at the same time evince the most profound ignorance of its resources, powers and improvements. To understand only one side of a question is said to be a good way of avoiding prejudice, but the critics I refer to, possess such an advantage in a more eminent degree—*they understand neither*. For instance the *Illustrated London News* says, "judging from the appearance of the various works produced, we should be inclined to conclude that the new art had reached its limits, leaving nothing further of importance to be accomplished. As a rival" (?) "therefore, of the fine arts, its powers and resources may be considered as known quantities, and we are still of the opinion which we have always entertained, that as far as the estimation of the real lovers of art goes, the palette and easel have nothing to fear from the camera and darkened room."

This critic has evidently made up his mind, and delivered judgment, without hearing a single witness.

* Read at the meeting of the Photographic Society of Scotland, on the evening of Tuesday the 12th.

Again, *The Times* tells us that "it is as well that the domain where photography ends should be so sharply and certainly fenced off as it is from that where art begins," and adds that "the proof of this separation is afforded by the conspicuous failure of all the photographer's attempts to make pictures."

Now is not *this* a pretty piece of argument? My new cook who took her place among my domestics, without sufficient knowledge of the duties belonging to her office, spoils my dinner, and I tell the guests her failure is a proof that it is impossible to produce a properly cooked joint.

I cannot attempt to reply to these and such things in my present paper, nor, with my present audience is it necessary to do so, but whether we have to deal with critics who believe because they always did believe, or denounce because they don't and won't understand, your practical man's works are in either case the best arguments to advance against them. Prove to the public eye that photographs *are* pictures, and we thus enlist in our cause that mighty monarch called popular opinion, before whom all this cant of criticism will become hushed, and all these dogmatic censors bowed in humble deference. We cannot convince these critics, perhaps, for their closed eyes and stopped ears place them beyond the reach of evidence or argument, but we can deprive their oracular dogmatism of its influence by the exhibition of our seccessful results.

If they point out the flat, adhesive character, of some hard, map-like landscape; place before them another full of space and ærial effect, *produced with as much ease and with the same appliances*, and show them that while the one was produced by a mechanical operator, the superiority of the other had its origin solely in the brain of its producer. If they deride pictures without roundness, or relief, hard of edge, with harsh black patches for shadows, and the high lights swallowed up by masses of glaring white paper; show them another, produced as before with equal appliances, in which the image is soft and round, with transparent shadows, and beautifully delicate half tints, gradating almost imperceptibly from the real high lights into the deeper tones and reflections of more retiring surfaces. They *can't* escape such arguments as these; and so the truth will ultimately triumph, and photography be raised in public estimation as an art in which, *however easy it is to do a little*, only artistic feeling and artistic knowledge can secure artistic results. *They* say it can't be done, *we* say it can; *they* speak in the thunder of the public press, *we* in the whisper of class journals and comparatively unknown societies. Our whisper, therefore, can't compete with their thunder in addressing the public ear; *but our works can speak with even more force and effect than they can command to the public eye.* I, therefore, again repeat that it is to our practical men that we must look for the art's real upward and onward progress.

(*To be continued.*)

Photographic Tourist.

PHOTOGRAPHY IN JAVA.*

ACCOUNT OF A SHORT PHOTOGRAPHIC RAMBLE THROUGH THE INTERIOR OF THE EAST END OF THE ISLAND.

Our first trip, after getting the cyanide, was to a hill in the neighbourhood, at a small elevation, though commanding a fine view of the valley of Ngantang, and which we took as a panorama in three views, it being too extensive for a single picture; we were very lucky to get some fine lowering clouds in the mountain range in the background, which, together with the sun illuminating some portions of the view, and others being in shade, had a very fine effect.

Each of the three plates succeeded perfectly on the first trial, with an exposure of fifteen seconds for the first, and eighteen and twenty-two for the others, owing to the decrease of light, as the sun had set by the time we had packed all up, the short twilight allowing us barely time to get home before it was quite dark.

In going and returning, we had to wade through a small river, rather above our knees, as there was no bridge without going some miles round; from it we filled a bamboo tube with water, and carried it up the hill with us, knowing we should get none there.

During one of our excursions at this time we tried the slanting diaphragm, recommended in "Sutton's Dictionary," by which the sky receives so much less amount of light than the foreground, giving the contrast with much greater truth than the ordinary diaphragm, with which it is difficult to take a view where a foreground of dark trees and a distance of mountains rendered blue by atmosphere, are required to be produced on the same plate.

Although we are rarely troubled by the many minor annoyances of the collodion process, such as foggy bath, spots, development stains, &c. &c., still we sometimes have our troubles, as what photographer has not, even in the more easily workable climate of England. About the time I write of, we were on one of our trips in the neighbourhood, very much bothered by not being able to obtain the slightest density in the negative, with any amount of exposure, though this only lasted for a few days. Again, shortly after, on taking some stereo views, every plate showed a very faint kind of stain on the part that touched the bottom of the slide, therefore spoiling all effect of clouds in the sky part of the picture. Many would perhaps not care about this, but with Indian ink or black varnish black out the sky, and so hide the imperfect part; but we have long had an aversion to that patch of white, which passes for sky in so many of the stereographs offered for sale. We examined our slide, thinking perhaps it was wet from the drainings, but found the plate only touched at the corners, therefore it could not be that; and after trying every remedy we could think of, such as a strip of blotting paper to prevent the accumulation of silver at the bottom of the plate, well draining it, &c. &c., we were obliged to have recourse to our other nitrate bath, when the effect ceased entirely, and things went well again; several days were spent in rambling about, taking every choice little bit that attracted our attention, until we had exhausted the place for several miles round; after which we proceeded on our way to Malang, a place resorted to for its beneficial climate by invalids, ; on the way we stopped twice, to take some pretty river views, introducing the wild ferns, which look very well in a photograph; also a mountain pass, the rocks at the side being covered with wild bananas and bamboo.

Half way to Malang we stopped at a place called Batœ, where we had hoped to get a view of the Ardjuna, a large volcano with the smoke issuing from the crater; but on rising in the morning, we found the sun just peeping from behind the mountain, and falling right into the mouth of the lens; this would not do, so we waited until evening, but shortly after ten clouds gathered rapidly over the mountain, and by about midday it was entirely covered, and remained so until night. As this was invariably the case daily, we gave up the idea, and started the next morning for Malang, where we arrived at 12 o'clock, just in time for tiffin, there being a good hotel there, which was a great treat to us, having had for some time to put up with what we could get.

As there was a good post road from Malang down to the seaport of Pasoerean, we hired post-horses for the journey, taking in the carriage our apparatus for photographing some ruins on the way down, sending the heavy portion of our baggage in carts. The ruins being only one post about six miles on the way, we arrived there about 7 o'clock, and at once took a picture of the small temple, which was so surrounded by a species of tree, sacred to the Javanese, that we were obliged to crowd it into the plate, as we could get no distance away, without having several boughs close in front of the lens, and the natives would on no account allow a branch to be touched. The next subject, in the immediate neighbourhood, was a gigantic figure, carved out

* Continued from p. 92.

of a single block of stone, being one of the finest specimens of the ancient Javanese sculpture, another figure representing the head of an elephant, with six hands was the next; this concluded our morning's work, which we were not sorry for, as the sun was getting too powerful to be pleasant, the place being situated in a much lower district than where we had previously been working. After repacking our things we once more started, and arrived by noon at Pasoerean, after after having spent an agreeable two months tour, and made a nice collection of some twenty-five to thirty views of each sort, stereoscopic and otherwise.

As many photographers in India and other tropical places might perhaps be somewhat benefitted by a few remarks regarding our experience, I will make a few notes on our materials, and mode of working, having already detailed our apparatus for travelling. First, regarding collodion, we have obtained some from nearly every celebrated maker in England, and after a deal of disappointment found invariably that nothing like sensitiveness was attained, with any of them, so we have for a considerable time manufactured our own. The pyroxyline in the ordinary manner, Hardwich's formula, having given us the best result, making it only in small quantities as we require it, as it is much the better for being newly made. The solvent in proportions of 5 parts of ether to 1 of alcohol, the bulk of the alcohol 6 parts more, being added as the iodizer. This we have found by a series of experiments to be the best proportions, though during a late visit to England, I failed entirely with it, finding it very deficient in sensitiveness, compared to other collodion, while here we find on the contrary, that it gives pictures in a third of the time of the ordinary ethereal collodion, both being made of the same materials. For an iodizer, *iod. pot.* is decidedly the best, cadmium giving a ropy sort of film, a a proportion of bromide is also necessary whether for negatives or positives. As developer, iron certainly gives the best results, intensifying with pyro if necessary, as if pyro is used alone the chances are, that the action of light will be reversed at the moment of completing the negative, having for a long time been annoyed with similar results, in nearly every case prior to our using iron. The best nitrate bath, made with the ordinary 30 grains fused nitrate of silver acidified by adding half a drop of nitric acid to an ounce of bath, and iodized by allowing one or two large plates, coated with iodized collodion, to remain in it for a night. This bath rarely gets out of order, as the evaporation always balances the amount of silver taken out, making the addition of fresh nitrate unnecessary, As regards cameras it is difficult to say which is best suited for a hot climate, as most of them go to peices, through the alternate changes of heat and damp. If the metal cameras advertised in our last *Photographic Journals*, turn out what they profess, they will be one of the greatest boons to Indian photographers.

After going through a course of dry processes, from the albumen on glass, to the raspberry syrup, we have come to the conclusion, that in a country where coolies can be had on the shortest notice, that the certainty of the wet process, outweighs all the advantages in portability of the dry.

With these oft repeated formulæ, I will bring my paper to a close, hoping that some one of the numerous travellers that photography attracts to foreign places, may gain some small benefit from my experience. WALTER WOODBURY

Java, October 30th, 1860.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE fifth meeting of the session was held in the Society's Hall, George Street, on Tuesday evening. Mr. T. B. JOHNSTON in the chair.

A paper, by Mr. Maxwell Lyte, detailing the method of positive printing so successfully adopted by him, was read to the meeting by the Henorary Secretary.

Mr. WALKER read a communication from Mr. Wall, of London, on the subject of "Art Photography" (see p. 125), in which the author pointed out the claims which photography had to be classed among the fine arts, and the means by which this position might be best attained.

On the conclusion of the paper—

Mr. HARVEY, R.S.A., while expressing the great delight he took in photography, stated the views which occurred to him as to the limited domain of photography, and the difference which would always exist between the pictures of an educated artist and a photographer.

He was followed by various other members, and an interesting discussion on the subject took place.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 13th March, 1861.

EVERY now and then the hopes of those who look to the realization of photography in natural colours are raised by some new result, which, if it does not fully solve the great problem, at least encourages the expectation that we shall, in time, arrive at it. The eminent chemist Böttiger lately exhibited some very interesting coloured proofs at a sitting of the Congress of Königsberg. A violet-coloured picture is obtained by causing paper to imbibe a concentrated solution of the double nitrate of uranium and potassa, and afterwards passing it through a solution of chloride of gold. If the latter salt is replaced by nitrate of silver, a brown red image is obtained. The oxalate of the sesquioxalate of iron yields a yellow proof which turns black in nitrate of silver, or brown by chloride of gold. A blue grey hue is obtained by sensitizing the paper in a solution of 6 or 7 parts of nitro-prussiate of soda, in 100 parts of water. A brown hue is produced by bichromate of potassa.

M. Böttiger has also modified M. Niepce de Saint Victor's process of transferring engravings by means of iodine Instead of exposing them to the vapour of iodine he immerses them in a bath containing 35 ounces of water, 45 grains of iodide of potassium, and 15 grains of sulphuric acid. The hydriodic acid formed is doubtless decomposed, for the iodine collects upon the fatty matter of the ink, as bromine, in analytical experiments, collects together in ether. After the immersion has been continued a sufficient length of time, and the solution has thoroughly penetrated the paper, it is removed and washed, then dried between folds of blotting paper, it is then placed on starched paper and submitted to pressure. In this manner a very faithful negative is obtained, but unfortunately, also very fugitive, which, however, can be fixed, if of sufficient importance.

A new mode of producing chlorine is due to the researches of M. Laurens. It consists in decomposing chloride of copper by the action of heat. The operation is conducted in the following manner. Chloride of copper is prepared in the usual manner, either by dissolving oxide of copper or native carbonate of copper in hydrochloric acid, or by the double decomposition of sulphate of copper and chloride of barium. The solution of chloride of copper obtained is evaporated and submitted to crystallization, then the crystalline mass is mixed with sand and perfectly dried (probably in a reverberatory furnace). The dried mixture is introduced into retorts similar to those employed in the fabrication of gas: if these retorts are of iron, they are lined with a coating formed of a mixture of clay and carbon, to isolate the metals. The chloride, heated strongly, is decomposed into *chlorine* and protochloride. The residue of the preparation of chlorine, *i.e.* the protochloride, is not lost. It can be again converted into chloride by the oxidizing action of the atmosphere in presence of hydrochloric acid. Having thus obtained the regenerated chloride, the operation is repeated as before described, and the circuit may be renewed indefinitely.

The advantages presented by M. Lauren's method,—which is analagous in principle to that proposed by Mr. Dunloyn Tennant—are chiefly the following: an economy of one half in the employment of hydrochloric acid, regeneration of the compound by a single direct operation. But possibly an objection may be made to the high price of the copper: numerous risks of loss are to be feared, either of the chloride during its decomposition, or of the chloride or protochloride in the unavoidable removals. There is also another consideration, which is, that in establishments where the chloride is produced, the handling of considerable quantities of chloride of copper will produce a dust which must prove injurious to the health of the workmen employed. What may be said, however, in its favour is, that this very interesting process is admirably adapted for the laboratory, as it readily furnishes dry chlorine without requiring a fragile and cumbersome apparatus.

In the course of his very beautiful experiments on the production of ice by the agency of ammoniacal gas, M. Carré has observed that brass immersed for several hours in a weak, cold ammoniacal solution, becomes as friable as clay. Iron, steel, and lead, under similar circumstances, remain unchanged. During these experiments it was also observed that ammoniacal gas, escaping under a pressure of one or more atmospheres, assumes a decided blue colour, similar to that of the smoke of certain woods, and of fuming acids.

Acetic ether is apt to be contaminated by free acid and alcohol; by adding water and magnesia to such ether, both the acid and the alcohol are separated at the same time; but as there will be some loss of ether by its solubility, as much salt as will dissolve in the liquid is added. The chloride of sodium prevents the solution of ether in the water, without eliminating the alcohol. The ether which separates from the salt-water is pure and anhydrous, with a density of 0·89.

Dr. Kursak proposes the employment of tannin as an antidote to strychnine; the dose to be one drachm of nut-galls to one grain of the alkaloid. Any astringent substance at hand may be substituted for the tannin, such as acorns, oak bark, chestnut bark, &c. Acids and spirituous liquors must be avoided.

LARGE STEREOSCOPIC PICTURES, AND NEW STEREOSCOPES.

Sir,—As it seems a sort of movement is now in progress having for its object the increase in size of stereoscopic pictures, and as a great number of stereoscopic cameras have been recently made for plates of 9×4, 8½×4, 8×4, 8×3¾, and 7¾×3½, perhaps a few remarks on the subject may not be ill-timed.

There has been for some years a general desire to introduce more subject into stereoscopic views than they have hitherto contained, but every attempt to do so has failed, because the present small stereoscope, with prisms or lenses of six inches focus, is not calculated for pictures larger than three inches square, and that focus having been universally adopted, it would perhaps be hopeless to attempt to induce the public to purchase other instruments for the purpose of viewing slides of a more expensive description. The generality of stereoscopes in present use are not rightly made, neither have they been furnished with sets of object-glasses of different powers, to enable us to exhibit and view pictures of various sizes at pleasure. Every instrument should be accompanied with two sets of prisms, being respectively of 6 and 8 inches focus, and prisms of 9, 10, and 12 inches focus should be available, if required by the purchaser. Each set of glasses should be fitted into a frame, which could be slided into a groove in front of the stereoscope, so that one set could be taken out and another put in, with the utmost ease. The stereoscope itself should be of the simplest description. A piece of mahogany 12½ inches long, an inch broad, and a quarter of an inch thick, should at one end carry a light frame to be held close to the eyes, and to receive the eye-pieces, and at the other a cross-piece to rest the slides against. This cross-piece should be made moveable, so that the spectator could slide it over the mahogany bar, and bring it and the slide as much nearer his eyes as he might wish. A handle might be made to screw into the bar and be unscrewed at pleasure. The cross-piece for the slides should be furnished with a screw underneath, to fix it at any distance required. No partition to prevent the right eye seeing the left picture, or the left eye seeing the right, is necessary, and the instrument thus constructed is the *ne plus ultra* of simplicity.

With a set of eye-pieces or prisms of six inches focus, we can view a slide mounted with two pictures of three inches square. For slides mounted with pictures of larger size, we require lenses or prisms, the focal length of which is equal to the length of the two pictures placed in contact with each other. Slides with pictures 4 inches square, or 4 inches long, require prisms of 8 inches focus, and with pictures of 4½ inches square or long, prisms of 9 inches focus. But when the pictures are taken with a lens of 7 inches, they may be seen advantageously with eye-pieces of even 18 inches focus.

But we must carefully bear in mind that small stereograms taken with lenses of 4, 4½, 5½, and 6 inches focus, should not be viewed in stereoscopes the object-glasses of which are more than one-fourth longer in focus than the focus of the lenses wherewith they were taken. If we do, we shall find that the minute details of the pictures are lost, or so diminished as to be ineffective. If, for instance, in stereograms taken with a 5 or 5½ inch focus lens, figures have been introduced whose features are perfectly discernible in the 6-inch stereoscope, on transferring the slides to an 8 or 9-inch stereoscope, we shall not be able to recognise them distinctly. If, then, we take care that the eye-lenses or prisms are not more than one-fourth longer focus than the lenses by which the pictures were taken, we shall adopt a safe rule, and preserve the full extent of stereoscopic effect. This rule, however, will be readily seen to operate so as to limit the size of the stereogram.

Pictures taken with lenses 4½ inches focus, must—in order to appear with the proper amount of effect—be viewed with prisms or eye-pieces of 6 inches focus. Such pictures, therefore, should not be more than the usual size, 3 inches square. Pictures taken with 5½-inch lenses should be viewed with glasses of 7½ inches focus, and those taken with 6-inch lenses, with glasses of 8 inches focus. If, however, 5½-inch lens-pictures are viewed with 8-inch glasses, they do not lose very much; indeed, not at all, if this lens be used for near objects, and the 6-inch lens for distant ones. I should, therefore, class them with stereograms taken with 6-inch lenses, and take both 4 × 3¾. This size would require glass plates of 8½ × 4, containing 33 inches superficial.

I would, therefore, recommend to all photographers who wish to take stereograms including a wider angle, to work with 5½ and 6-inch view lenses, upon plates 8½ × 4, and to use stereoscopes for their exhibition mounted with prisms of 8 inches focal length. This arrangement would leave the present stereoscope and its slides as they now are, and those who now prefer that size can get all they wish with 4½-inch lenses. They can even take views 3¼ × 3 upon the usual stereo-plates, and mount them for the larger stereoscope, or one with 6½-inch object-glasses, if they so wish.

In purchasing stereoscopic view lenses of 5½ and 6 inches focus, it must be ascertained that they will cover the field required. I mention this, because I have met with lenses which will not do so. I possess a pair of most admirable single lenses by a French maker, of 5½ inches focus, which will not give a circle of more than 5 inches diameter, owing, I suppose, to the mode in which they are achromatised. They were intended specially for stereoscopic work, and to give pictures of 3 inches square only. But a really good 5½-inch focus lens should give a square of 3¾, and a picture of 4 × 3¾. A pair of Goddard's 5½-inch lenses in my possession will cover a 5 × 4 plate well. Their diameter is 1⅜, which in my opinion is a great advantage where a ⅜ths aperture is used for instantaneous work. Six-inch lenses should have a diameter of an inch and a half.

Trusting that these remarks will tend to produce uniformity in the size of glass plates and stereo-pictures on an enlarged scale, I respectfully submit them to the judgment of your readers. I am not aware that what I have said will be found in any publication on the subject, but I think that those who will take the trouble to test the accuracy of my statements by actual experiment, will find them correct.

The subject of stereograms taken with a lens of 7 inches focus I shall not now enter upon. They involve considerable expense, and are perhaps best taken with separate cameras, or, at all events, upon separate plates. I will only remark, that when viewed in a 12-inch focus stereoscope, their effect is really fine. Views taken with lenses exceeding 7 inches focal length, are more suitable to the reflecting than the lenticular stereoscope. R. A. R.

COLLODIO-ALBUMEN PHOTOGRAPHY.

DEAR SIR,—In a recent number of the NEWS, your correspondent "G. P." has called attention to the fact, that my observations in reply to his previous letter are not immediately directed to the question, as to the possibility of coagulating albumen at any temperature when it exists as a thin layer upon a collodion film. I admit that I did not confine my remarks exclusively to this particular question, for the simple reason that other points of equal or even greater interest were touched upon by your correspondent himself, and are associated with the inquiry.

The primary question, for instance, "as to whether sensitiveness is dependent or effected by any structural change in the albumen" constitutes an essential element in the determination of the best method of practising collodio-albumen photography. It may be true that in our present state of chemical knowledge it is impossible to define an exact limit between chemical and structural modifications; but it is equally so, that the photographic bearing of the subject constitutes a sufficient justification for the further investigation of the subject. The observations made by Dr. Riley, Mr. Hardwich, and myself, implied a common understanding that additional knowledge must be acquired before a decisive conviction could be arrived at, and Dr. Ryley invited discussion with the remark that his only reason in bringing his paper before the society was to *elicit* truth. "G. P." however, desires to direct attention more especially to the erroneous notion involved in the supposition that heating and drying the plate coagulates the albumen. "The question," he observes, "whether the film of albumen can be coagulated by drying the plate, at any temperature, however high, is of too much importance to be passed over slightingly, and I am very sure it cannot to left in more able hands than Mr. Davis's, if he will experiment upon the subject without bias." The above remarks do not define as to whether the film of albumen is presumed to be superimposed upon the collodion film, or to rest directly upon the glass. As it is always desirable to study any particular reaction under the simplest condition, I have given a little attention to the inquiry, under the latter circumstances, during the interval that has elapsed since the publication of the letter from which I have made the last extract. The exact method that I pursued was as follows:—I first covered a glass plate with white of egg, drained off the superfluous quantity from one of the corners, introduced it into a Taylor's hot-air bath previously heated to about 180° Fah., and there allowed it to remain for about ten minutes. After this treatment the plate did not exhibit any appearance of opacity, and, therefore, no perceptible indication that the film of albumen had suffered coagulation. It naturally occurred to my mind that the tenuous condition of the film might be the cause of the absence of any appearance of coagulation, a slight abrasion of the surface, proved however, the contrary. If the above experiment may be considered conclusive, and it can be shown that the same reasoning holds good with respect to the albumen within and in immediate contact with a collodion film, I must necessarily agree with your correspondent, that I entertained and expressed an erroneous idea when I stated that both the structural and chemical properties of the film must have been altered by the *process of coagulation*, because my albumenized plate had been submitted to a temperature sufficiently high to set white of egg in its ordinary condition. The reason that the albumen is not set by the treatment referred to appears to be this: a considerable portion of the water which is combined with it in the normal condition of the white of egg is separated by evaporation before the film is heated to the requisite temperature. In other words the water is driven off at a lower temperature than that necessary to produce insolubility, and such being the case, the dried white of egg may be exposed to a heat of 212° without any alteration of its properties. It has already been recorded in the report of the Experimental Committee of the South London Photographic Society, that if we immerse a film of albumen resting upon glass into boiling water, we wash it therefrom, and consequently obtain no evidence of coagulation. This probably arises from the circumstance that small quantity of albumen present is largely diluted with water before the necessary elevation of temperature is reached. We now pass to the effect that is produced by the action of a cold solution of gallic acid upon a similar film to that under consideration. In this instance, we find that after a short immersion a slight opacity is produced, the tenacity of the film to the glass is destroyed, and the compound may be freely washed from the plate. If, on the other hand, the albumenized plate be immersed in a solution of nitrate of silver, we find an immediate opacity produced, indicative of the formation of albuminate or albumino-nitrate of silver, other insoluble metallic salts of the precious metal, but probably no change that can be strictly designated coagulation. In this instance we find that the normal tenacity of the film to the glass is not destroyed, but that it may be washed freely with an abundance of hot or cold water without the displacement of that portion of the layer in immediate proximity to the plate, from the surface of the glass. It will be noticed that the above experiments have reference to albumen resting upon the glass itself, but when we pass to the consideration of the latter within the interstices of the collodion film itself, the inquiry necessarily becomes more intricate and difficult. But assuming from analogy that the above reasoning is applicable to the layer of albumen resting upon an excited collodion film, we can readily understand that its removal would be effected by cold and boiling water, or a solution of gallic acid. I do not find, upon the other hand, that by treating a *washed albumenized plate*, from which the whole of the free nitrate of silver has been previously removed, gains any increased sensibility by being treated with the solution of gallic acid, although there is a difference in the colour of the resulting negative. As a similar result accompanies the combination of some saccharine substances mixed with the albumen solution, we have reason to attribute each alike to a chemical cause. When, upon the other hand, we treat a washed albumenized sensitive plate with a solution of nitrate of silver, we obtain increased sensibility, inasmuch as we convert an insensitive into a sensitive albumino-nitrate of silver compound. If, therefore, we desire to increase the sensibility of a plate prepared according to my suggestion in the report above alluded to, we have only to dip the plate in a weak solution of nitrate of silver, wash, dry, and expose it as soon as convenient. I say as soon as convenient, because we shall find that we have destroyed its permanent keeping properties.

Although we cannot but feel that we have much to learn upon the subject, yet we may reasonably hope that the theory advanced by Dr. Ryley, the distinction between drying and coagulating albumen, to which "G. P." drew attention, together with the recent investigations that have followed thereupon, have not been altogether ineffectual in contributing to a more correct understanding of the principles of collodio-albumen photography.

THOMAS SEBASTIAN DAVIS.

Photographic Notes and Queries.

Alkaline Toning and Permanent Photographs.

Sir,—Under this head I purpose to address a few observations to you, and through you to the photographic world at large. I read in this week's News that alkaline toning is objected to on account of its *blistering the fingers.* Now, sir, I write this with the utmost respect for the author of the above remark, but photography is not the only profession in which votaries will disagree, and using the alkaline toning myself, knowing many others who work it, and not having heard one single instance of so injurious a result to the operator, I feel bound to take up the cudgels on behalf of our favourite method of toning and fixing. I have had the fingers turned yellow with the gold, but the raising of pustules, rather than ascribe it to the toning, I should lay it to the unfortunate flesh of the individual.

"The permanence of photographs."—In conversation the other day I was questioned on the above, and in very distinct terms informed that our pictures were but transient ones, that *they faded.* It is a bold assertion, nevertheless, I am justified in making it, but a *photograph is permanent.* Properly attended to there is no doubt on the subject; the free nitrate washed from the proof before immersion in the gold, washed from gold before being fixed in *fresh* hypo, and then after having been plunged in water, placed on a sheet of glass washed under a tap with a piece of cotton wool, changed frequently for, say four hours, in running water, then for four hours more in several changes of lukewarm water, and I venture to assert, that such treatment ensures the permanence of the picture. Let those who doubt try, and "be not persuaded, but convinced." One word more on the pictures which undoubtedly do fade; for them the public have themselves alone to thank; they will have *cheap* photographs, they delude themselves with the happy belief that a photograph "is all profit, only costs this, we will give that," and the result is the wholesale production of *things* which fade before they are sold, a disgrace alike to purchaser and seller; as for the instrument or machine who "executes" (!) them, I leave him to the tender mercies of his conscience—when it awakens!

Let me, in conclusion, ask the public to give a fair price for pictures, and there will be no longer complaints on the unstability of the productions of our art! A proof paid for is a proof permanent; but a "representation" at *per gross*, is an "unfortunate," plunged with all its free nitrate on its face into a *boiling* mess of hypo, acid, sulphur, &c., &c., *ad lib.* Apologising for so long a note, and enclosing my card, I am, sir, yours respectfully, Phos.

Alkaline Toning.

Dear Sir,—I was reading a work the other day on the preparation of salt, when my attention was drawn to the following, which, in my opinion, must exercise a deleterious effect, and perhaps be the cause of many of the faults complained of by numerous operators in this process.

In the preparation of salt from the springs it is put into a large pan and boiled, *that* prepared for the table, called common salt, and sold in pyramidical shapes, being of a finer quality, is boiled much faster, and contains (in consequence) when sold *a considerable quantity of lime.*

Now, in the last wash given to the prints before toning, it is recommended to "place them for three or four minutes in a bath containg a quarter of an ounce of *common salt* to the pint of water," some operators say "one ounce of salt, and water *ad lib.*"

Now, from experiments I have made, I find, that *common table salt,* when used in the quantity of an ounce to the pint, *causes* a film over the print, and renders it very difficult to tone, in some cases the toning bath has no action on it whatever. (The use of such a bath we know is to convert any trace of silver into a chloride.) This film is called chloride of silver, erroneously, I think. On immersion of the prints in the salt bath they at once become of a golden red colour, and if left in the bath for five or six minutes, sometimes less, become covered with a white deposit, which will *not* rub off; sometimes it is but slight, at others very dense. When slight, I have frequently got an uneven tone, being spotty, and of a dirty brown. When dense, I get no tone at all, and I find that those prints speedily spoil.

Flake, or rock salt, or pure chlor. sodium gives very different results. On immersion in a bath of this, 1 ounce to the pint, the print takes a clear red tone, but no deposit occurs, and on immersion in the gold bath,the toning proceeds evenly and well, and such I now always adopt.

In conclusion, I would ask those operators who complain of uneven toning spots, &c., to try both kinds of salt, and judge for themselves.

My attention has been drawn lately to the remarks upon the argentometer. I bought one three years ago of H. Francis (3s. 6d.) On trying it to-day on an old sensitizing bath, it registered 30 grains nit. argt. to the ounce aqua. On testing a sample of the same bath with Bolton's test by chlor. sodium, I got 29 grains to the ounce. I have always found the little instrument pretty correct, sufficient, at all events, for sensitizing baths for paper. Apologising for troubling you, I am, dear sir, yours truly, W. H. Warner.

Ross, March 7, 1861.

The Tannin Process.

Sir,—The merits of the "tannin preservative process," mentioned in page 119 of your last number, will soon be widely canvassed, and "failures" and "successes" will soon occupy the attention of your readers. The announcement of its discovery and value, coming from such a trustworthy source, and such an exact experimentalist as Mr. Hardwich, will doubtless induce many who have been unsuccessful with the ordinary dry processes of Taupenot and Fothergill, to try their hand at this. I have not yet seen the new edition of "Photographic Chemistry," and am. therefore, in entire ignorance of the mode of manipulation therein recommended, but I venture to send you an account of my first experiment, which has yielded me very excellent results. The point of information from which I started, was the fact mentioned in one of your contemporaries, that the process consisted of an application to the sensitized collodion film of a solution of tannin, which was simply dried on its surface. From the nature of this solution I at once saw the necessity of thoroughly washing off the free nitrate previous to applying the tannin, which in combination therewith would otherwise soon set up a decomposition fatal to that degree of stability so requisite in every keeping process of any value to the tourist. After removing the plate from the bath, I washed it in a solution of a teaspoonful of common salt in two quarts of pump water. The plate was stereo size, and I washed it with a wave-like motion in five or six changes of this water, allowing it to remain altogether therein about 2½ minutes. On taking it out I applied the pneumatic plate-holder. and poured on its surface about an ounce of distilled water to get rid of the salt solution. I then dosed it with as much of a filtered solution of tannin (one grain of this to one ounce of *distilled* water) as would well cover it, and allowed it to remain for about a minute, then drained and dried. Plates thus prepared are very sensitive (a little more so than Fothergill's, and develop rapidly, and without stains. They promise also to keep well; I have kept them for about a week without any perceptible deterioration. After exposure soak the plates for two or three minutes in a little distilled water heated to a temperature of about 100° Fahrenheit, *i.e.*, so as just to feel warm to the hand. I used the ordinary pyrogallic developer. I do not give you this as embodying the best proportions, or the best mode of manipulation, but merely as the result of a first and highly favourable experiment.—Yours, very truly,

Willand Ford, March 2, 1861. H. Fitzroy Pelham.

Yellow Glass for Dark Rooms.

Sir,—Having had occasion lately to purchase some glass for a photographic dark room, I ordered it of a respectable house in London, specifying it as "orange-coloured glass for photographic dark room." The material received, designated in the invoice as "orange-coloured pot-metal," appeared to me of rather a light colour; I therefore exposed a sensitized collodion plate underneath a piece of the glass to the northern sky for 20 seconds, and developed it. The result was, a fine dense deposit of silver over the whole plate, except a portion of the middle, where a strip of brown paper was on the orange glass. I, of course, returned the glass as useless, and asked for another sample, and and at the same time I wrote to two other London houses for samples of glass for the same purpose.

On obtaining these three samples—the first, *stained* glass of a rich orange colour, at 2s. the foot; the second, a darker reddish orange glass, at 1s. 3d. the foot; the third, a bright yellowish orange, "pot-metal," at 1s. the foot.

A small square of each of them was let into a piece of board, and a sensitive plate was exposed underneath it to the northern sky for 30 seconds.

A print from the developed plate I enclose. No. 1 developed a deep black; No. 2, nearly the same, but not so dense; No. 3 showed no trace of the action of light, not even an appearance of fogging.

These facts may be useful to your readers, as they show the necessity of care in the selection of glass for photographic dark rooms, even when the most respectable London houses are dealt with.

It also shows that the deep reddish orange coloured glass is not so effectual a guard against actinic rays as the bright yellowish orange of No. 3 sample, which also admits much more *yellow* light to work by.—I enclose my card, and subscribe myself obediently yours, H. S.

Chatham, March 5, 1861.

[Our correspondent has forwarded to us the print referred to, and also the samples of glass. So far as the appearance is concerned, we should have been led to expect that those marked one and two would have been perfectly non-actinic. We shall endeavour to obtain some information as to the causes in operation. Ed.]

Chloride of Gold from Alloyed Metal.

Sir,—Having some old gold, such as the setting of false teeth, old jewellery, &c., and wishing to turn it into the *chloride* for photographical purposes, but knowing it to be impure, probably containing copper and silver, (I know how to obtain it from the pure metal), I should be glad if any of your numerous correspondents would enlighten me in the refining process.—I remain, dear sir, yours sincerely, J. L.

Green Rig Villa, Blencogo, Wigton, Cumberland.

[If silver be present it will be thrown down as a flocculent precipitate in dissolving the gold in nitro-hydrochloric acid. To remove copper—as soon as the gold is dissolved, dilute the solution freely with distilled water, and then add a solution of sulphate of iron in the proportion of six parts of iron to one of gold—this will precipitate the gold free from the copper. Redissolve the precipitate in nitro-hydrochloric acid, and proceed in the usual way. We shall enter more fully into these points in the articles on "Photographic Chemicals, their Preparation, Adulteration, &c."—Ed.]

Turpentine Waxed Paper.

Sir,—In reply to some of the inquiries respecting the turpentine waxed paper process, allow me to say I have found it best to buy the paper ready prepared, from Marion and Co. In justice to those who buy, I should add that I have had some very bad paper from them; but the faults arose from causes beyond the control of the preparer, being caused by the metallic spots in the paper, which do not show till the developing solution is used.

I have employed it for stereoscopic negatives with a Lerebour lens, and have some which have produced prints, mistaken for the results of collodion.

I found a *saturated* solution of gallic acid gave me good pictures, when Mr. Sisson's saturated solution, mixed with an equal quantity of water, was useless.

The spare solution can be added to the gallic-acid solution. Discoloured baths are entirely avoided, and the annoyance of a weakening bath is spared.

I believe it is best to excite all waxed papers on a glass slab. Two drachms of aceto-nitrate solution poured on the glass, and spread with a slip of paper, is the quantity for a single sheet, when it appears to be *white* when it must be lifted and turned on the glass, for a minute or two, before transferring it to the washing water.

For the second paper, pour *one* drachm of fresh aceto-nitrate; and after it is ready, drain the slab, and begin again with two drachms.

Unbleached wax is more pure than white, and is practically as good for photographic operations.

Wax is prepared by putting combs into water and boiling them; then separating the dross by straining it through a coarse cloth, or by skimming it off. Of course, the whiter the comb, the finer the wax. I have some given to me by a friend quite white. Yours obediently, J. B.

March 12th, 1861.

Specific Gravity Silver Meters.

Sir,—While the hydrometer question is still afloat, I would say (with your permission) a few words on a modification of the specific gravity method adopted by me for some length of time, which gives for printing purposes results to a quarter of a grain if desired. Proceed as follows:—Obtain a light glass flask, tube, or other convenient vesssel of *little more than one ounce capacity when quite full*, into this measure one ounce of distilled water, then fit a cork with one of the fine glass tubes pencil leads are kept in, through the centre (or simply as a V groove) and adjust it to the neck till the water appears at the top of the tube. Mark its position on the neck at the bottom surface; —Now weigh the whole arrangement in the balance, and obtain the counter-poise in one piece for future use. By substituting the solution of silver under trial, for the water, you will assertain the number of grains per ounce by the extra number of grains it takes to equipoise the vessel. In conclusion I would suggest; *In medio tutissimus ibis.* H.

Photography on Wood.

We have received an interesting letter on this subject, some extracts from which we subjoin. After referring to our allusion to an engraving by Mr. Langton from a photograph on wood, which appeared in the *Art Journal*, in 1854, our correspondent proceeds:—

"Being at that time an apprentice to Mr. Langton, I know all the facts in connection with the subject inserted in the *Art Journal*. The subject was from the original drawing of the moon, made by Mr. Nasmyth, of Patricroft, near Manchester, from which a small negative was copied by the Rev. St. Vincent Beechey, of Worsley, near Manchester, and printed on the wood by that gentleman, which was executed *with difficulty* by Mr. Langton, on account of the prepared surfaces of the wood chipping off very frequently, consequently the redrawing had to take place before proceeding any further in the engravings.

"To the best of my knowledge the photograph engraved was the best for the purpose out of many experiments made by the rev. gentleman, who, at that time, I considered a clever photographer.

"Previous to this there were some engravings on wood in the *Practical Mechanic's Journal*, executed from photographs on wood, which were obtained by loosening the film of the glass positive, floating it in water, and finally launching it on the wood.

"This had the priority of Mr. Langton, whose supposed invention was made known throughout England and the Continent, and the worthy editor of the "Practical Mechanic's Journal" reading of the circumstance, kindly sent Mr. Langton a copy of the above publication containing the engravings from photographs on wood.

"I do not think Mr. Langton has, since 1854 made any further attempts with the Rev. St. Vincent Beechey's invention, nor has he done anything with photography, being too much engaged in the engraving department, in one branch of which I consider he stands unrivalled, that of machinery engraving.

"During my apprenticeship I made several attempts to photograph direct from the camera, in which I succeeded, the subjects being a moderator lamp, stereotypes of which I now have.

"I am now preparing a series of photographs on wood, which are taken direct *in the camera*, and which have not the slightest obstacle in the way of being engraved by any ordinary engraver on wood.

"I will, ere long, forward you specimens for inspection.

"If I mistake not, Mr. Bolton stated, some time ago, in the pages of the News, that he was the first to produce a photograph on wood, which could be executed. Now if that gentleman will give the date of his first success, it will materially assist in discovering as to who first practically made use of photography on wood for engraving purposes.—I am, dear sir, yours, &c. Bennett Lowe."

[We shall be glad to see the specimen to which our correspondent refers.—Ed.]

Talk in the Studio.

Presentation Photograph.—The Sub-Committee appointed by the South London Photographic Society to select a print for presentation to the members, have decided on one of Mudd's well-known photographs—tho picturo being "Coniston Falls," the prize picture of the Scottish Exhibition last year. Perhaps few photographs that have been exhibited embody and combine so many of the elements which go to make a successful picturo as this effort of Mr. Mudd's. It is a striking and sublime subject, combining a bold vigorous foreground, with the turbulent water leaping, tumbling, and frothing over the jagged and broken boulders, with a background in which gradation after gradation of distance carries the eye on to the far-off hills. Not only is tho subject so fine and the view well chosen, but the photography is magnificent. We are tempted to adopt tho Irishman's criticism, who remarked that "thore was but one word in tho language which would express the beauty of a certain actress, and that *mono*syllable was—perfection!" There is not a square inch of tho picture which does not present in itself a study of wondrous detail, whilst the harmonious massing of the lights and shadows and the general breadth constitutes this a most perfect picture. Tho photograph selected last year was one of Bedford's fino views of "Tintern Abbey," by the wet process, and consisted chiefly of foreground effects. This year the picture of a master in the collodio-albumen process is selected, and one in which tho distance is peculiarly charming. We congratulate the members on the judicious selection of their Committee, which thus secures examples of variety of style and process, as well as of tho highest excellence in each.

International Exhibition of 1862.—The designs for the building are now completed and drawn. The extent of grouud covered and the capacity of tho building generally will be greater than that of 1851. Glass and iron will not, as before, constituto the entire fabric, but will be largely used in connection with brick and stone, in the outer walls, whilst iron columns and girders of gothic character will be used inside. There will be a magnificent dome of glass and iron larger in every way than St. Paul's, or St. Peter's at Romo; it will be in fact the largest domo in the world.

Art Committee.—Her Majesty's Commissioners havo invited a number of persons distinguished for art knowledge, to form a committee of advice on various interesting questions related to art. The Duke of Buccleugh, Earl Stanhope, Sir Charles Eastlake, Messrs. R. S. Holford, M.P., Wm. Stirling, S. H. T. Hope, have already consented to join tho committee.

Soane Museum.—Mr. Joseph Bonomi has been appointed to fill the recently vacant post of curator to this museum. The choice is considered by all who know this gentleman's interest in, and fitnoss for, the duties, an excellent one.

To Correspondents.

N. W.—Very excellent views can be taken with positive collodion, and subsequent intensifying; but it is a simpler plan to take them by one process with negative collodion, unless extreme rapidity be important. Either of the processes you name for intensifying will give good results. A mixture of 1 and 2, or 1 and 4, or 2 and 4 will probably give you good results. We have not tried Mr. Fry's method of making the printing bath; but he has used it for years. River water or spring water. The white powdery lines on the shadows of your picture, probably proceed from scum on the top: look to that; a little more acid in the bath may help you. The stop between the lenses should be nearest to the front lens.

F. Lane.—Such specks are not uncommon when there is an excess of nitric acid in a developer. But these you name are apparently reduced in the bath. Filter and add some new solution.

P. X.—About twenty grains of nitrate of silver and twenty grains of citric acid to each ounce of distilled water is a good strength for citro-nitrate of silver to add to a developing solution. The number of drops to be added to the developer will somewhat depend on circumstances; about ten or twelve drops to half an ounce of pyrogallic solution will generally be sufficient for dry pla s, or less if you wish to develop slowly so as to secure abundance of detail without over-developing the highest lights.

J. C.—Opinions vary as to the best distance between the twin lenses of a stereoscopic camera. Where two inches and a half is spoken of as the exact distance, it is on the supposition that this is the exact distance between the human eyes. Where the camera front admits of no lateral motion of the lenses—and none is needed—about three inches or three inches and a half, are better than two and a half, as a little more relief is obtained in distant objects, without much of the effect of diminished size, which a great distance between the lenses is apt to give. In using a binocular lens camera for the production of transparencies, the glasses must be cut: or if it be desired to avoid that, the pictures must be taken at twice, altering the position as in a single lens camera on Latimer Clarke's principle.

H.—The syrup for the dry albumen process will keep some weeks in a cool place. 2. The plates are better excited immediately on cooling the plate, and whilst it is warm. 3. A proper bath must be prepared; it will become gradually discoloured, and may have the colour removed by means of kaolin, or what will cause less risk to the silver bath, citric acid. 4. The plates will keep well a month, probably longer.

J. H. M. R.—We cannot tell you the price of a plano-convex lens three inches diameter, as much would depend on the quality, and the optician of whom you purchase it. Possibly about half a guinea. 2. It is quite impossible to state the exposure required by any plates, as it depends on the kind of lens, the size of stop, the kind of view, the season of the year, and many more conditions. Practice alone will guide you in this respect. Pyrogallic acid is the developer used for Dr. Norris's plates. If your question refer to the printing of transparencies on these plates, a few seconds exposure to diffused daylight, will suffice. See article in this number on the Tannin Process.

G. Mackellar.—It is difficult to say which is the best dark tent or box for developing. Leake's, perhaps, is the lightest and cheapest; Smart's, perhaps, the most complete. Two or three others are now in course of preparation by different makers. We intend shortly to give descriptions of several.

R. R.—The most usual chemical action of light in photographic operations is to darken. In the Daguerreotype process the plate of silver is brought to the blackest possible polish, and having been submitted to the fumes of iodine and bromine, exposed to light, and then submitted the vapours of hot mercury, the impressed image is white, or rather various gradations of white and grey, upon the black plate, which forms the shadowed or black portions of the picture.

D. G. Morgan.—An iron developing solution for negatives may vary in strength according to the requirements of the collodion, the temperature, &c. About fifteen grains to the ounce at the present season of the year, and about ten grains in summer, is about the strength we prefer. In all cases, the amount of acetic acid should at least equal that of the iron. Some very fine negatives that we have seen have been produced by a fifty-grain iron developer. Remember that to obtain the full value of iron, as a developer for short exposures, your collodion should contain a small portion of a bromide as well as an iodide.

J. H.—River water or spring water is referred to.

G. S. S.—It is much a matter of individual taste. Many good operators prefer a stereo lens of 4½ inches focus. Wilson uses one of 6 inches focus. In the new stereo lens you name you have the advantage of both a long and short focus without any sacrifice in either. We prefer it for our own use very decidedly.

No. 35.—The "new discovery" to which you refer is, as you phrase it, a very decided "sell." It simply consists in taking a newly printed wood engraving, and whilst the ink is wet, causing it to "set off" on to another clean piece of paper, and obtain an imperfect duplicate impression. It was exposed in the Photographic News, p. 192, Vol. IV. The Debusscope is a pretty philosophical toy, giving effects something like a kaleidoscope. The slides are coloured diagrams to vary effects.

F. S. C.—No. 9 is out of print, aud reprinting would not be remunerative. We hope to get a few copies from agents. 2. Marine glue is usually obtained at the tool shops. We do not know any special house that keeps it. We got a quantity some years ago at a shop in the neighbourhood of Fitzroy Square, and have not required any since. The manufacturer is Jeffery, somewhere in the Commercial Road.

G. P.—The slip to which you refer desired an answer to be given to "Alpha," which, as you see, was done. We shall have pleasure in proposing you as we there stated. You can send us your name and address, or you can call upon us at the office on a Thursday afternoon. We shall be glad to see you. The next South London Meeting is on the 21st inst. We do not for one moment impute illnatured motives; but your letter certainly appeared to have a captious tone. We have, and can have, no motive but the elucidation of truth, and we feel it is important to eliminate from scientific discussion everything which can be construed into acrimony. If gentlemen who take part publicly in aiding the progress of photography feel that such effort subjects them to criticisms which at least *appear* captious, it will have a tendency to repress such effort. In regard to the question of anonymous writing, we make a great distinction, as we have before said, between personal and public matters. An individual criticizing or public body in *propria persona* stands at a disadvantage sometimes, and therefore does it anonymously; and so long as it is done with truth, dignity, and temper, he may be right. When two persons discuss, the case is different; they should stand on equal terms. Our correspondent will find a communication on the subject of his letter in the present number, which possibly may somewhat explain what he desires. For the rest, we shall be glad to talk to him.

J. C. B.—1. Yes. 2. We don't know. 3. We know of one or two new ones now making; we can tell you better therefore in a week or two. 4. We should not like it for own use.

A Subscriber from the First.—The lines across your plate probably arise from a stoppage or hesitation in plunging the plate into the nitrate bath. The plate must be lowered into the bath steadily without any pause.

Tyro.—Light grey will be the best colour for your background. The best and cheapest material is unbleached sheeting calico which can be had of great width at a trifling cost. Dying would do if the right colour were obtained, and the cloth kept out of focus so as to avoid showing the texture. A very simple plan is to paint it in distemper either a light buff or a light grey, using plenty of size in the colour. Before using, try a patch of it and let it dry; then ascertain the colour it gives on taking a photograph of it. By this means you will ascertain the modification necessary before covering the screen. It would be more durable if painted in oil and "flatted," that is, let the final coat of paint have no more oil than is absolutely necessary, using turpentine instead, so that it may "bear out" flat or dead. This will be a good background for portraiture generally; but it is well to have two; one like that described, and another a little darker. We cannot advise you to have one made in town, as it will be more likely to suit your purpose to do it yourself, or have it done under your own superintendence; besides the risk of injury in carriage.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 133.—*March* 22, 1861.

THE ETHICS AND ETIQUETTE OF SCIENTIFIC DISCUSSION.

We remember being amused some time ago by the order and classification into which a gentleman—himself a member of more than one learned society—arranged the peculiarities of temper which universally, as he stated, characterised the members of different scientific bodies. His theory assumed on the one hand, that the favourite pursuit influenced the temper of the man, or, on the other, that the mental conformation which gave a bias in favour of any particular science was generally accompanied by its given idiosyncracy of temper, and that success in the science was generally accompanied by an augmentation of its accompanying peculiarity of temper. Without following out this whimsical theory, which was accompanied by a few illustrations which seemed to give it some show of truth, we took exception to one case in which we thought it assuredly broke down. The pursuit of one science was stated to be accompauied by a waspish acerbity of temper, and the attainment of eminence accompanied by a degree of quarrelsomeness and dogmatism utterly intolerable. To this we took entire exception, feeling assured that shallowness and ignorance of truth alone could produce dogmatism or quarrelsomeness on its behalf.

It might be an interesting study, however, to the psychologist to consider to what causes is due the fact—happily rare, but still sufficiently familiar to all interested in scientific debate—that an amount of acrimony and bitterness is at times imported into discussions, involving no personal considerations, which is utterly astounding and inexplicable. We think perhaps amongst many causes, there are two chief ones operating in conjunction with natural infirmity of temper. The first, which produces the milder form of acerbity, is simply inconsiderateness, a sheer oblivion of the possible construction cutting words may bear, or the possible pain they may inflict on others of sensitive temperament. The second cause, which leads to the grosser breaches of good manners, is simply ignorance combined with a naturally snarling temper. We believe it is nothing more. We are unwilling to believe in the existence of unprovoked malice, envy, and all uncharitableness. Ignorance is sufficient, we think, to account for much which bears the appearance of these vices. Ignorance of the laws of courtesy and kindness; ignorance of when they are violated. We are inclined to agree with Pope, that—

"Want of decency is want of sense."

Whatever may be the causes, however, from which acerbities spring, it is a most important thing to eliminate them as far as possible from scientific discussion. Even in their mildest form, they must have a most repressive influence on the freedom of debate. That discussion should be entirely unfettered, there can be no need to affirm or enforce; but there is an immense difference between liberty and licence. That errors should be pointed out, and misleading statements confuted, there can be no doubt; but that offensive language should be employed is surely unnecessary, and the misfortune is, that it too frequently happens, that as argument grows weak, phraseology becomes strong, and when the position cannot be destroyed, the person is assailed.

That this is a state of things to be deprecated cannot be disputed. The habit of pouncing upon, and "putting down" every accidental *non sequitor* or doubtful statement, except where important interests are at stake, is a most dangerous one in any individual, and often serves to keep silent others who, but for the indisposition to subject themselves to such treatment, might make important contributions to the common stock of knowledge. A case in point occurred only the other day at a photographic meeting. A gentleman whispered to his neighbour an important fact bearing on the subject of discussion.

"Why do you not get up and say so to the meeting?" was the reply.

"Oh, because I should probably have so and so down upon me immediately," was the rejoinder.

Where this tendency arises from inconsiderateness, combined with, perhaps, an over anxiety at all times for literal exactness and accuracy, we are sure that a very brief hint will suffice to correct it, and suggest the importance of some regard for the personal feelings of opponents, as well as for the elucidation of truth. Where it proceeds from ignorance, it rests with Photographic Societies and Photographic Journals to teach and enforce courtesy, by suppressing rudeness and personality in the meetings of the one, and excluding it from the pages of the other.

We cannot enter into any enlarged consideration of all the bearings of such a subject here; but we have been led into these brief remarks by the fact, that we have recently been compelled to omit from our pages letters containing important remarks on interesting subjects, simply because those remarks were expressed, in and accompanied by, an apparent spirit of personality and captiousness, to which, for the sake of free discussion, we are compelled to object. We have said an *apparent* spirit of personality and captiousness, because we believe, in some instances, the phraseology has simply proceeded from the inconsiderateness to which we have referred, aud not from any wish to offend. Unfortunately, where the motive is not apparent, the pain inflicted is not the less real.

Another motive which has induced us to make a few observations on this subject has arisen from the papers of Mr. Cramb, of Glasgow, on the silver meter controversy. Our readers have been made familiar with all the facts necessary for their guidance in this matter, and many of them have proved, practically, the value of the hydrometer for its purpose. Mr. Cramb has, in another angry article in a contemporary, returned to the question; but as a great part of his article consists of misstatements and abuse of ourselves, it were a bootless task, unpleasant to ourselves, and unprofitable to our readers, to follow him. Even had we been disposed to do so, we are somewhat disarmed at the outset by a statement that he is unable to find in his paper any just cause for the charges of rudeness which have been brought against him. Now, when a man can call the experiments performed before a scientific society to their entire satisfaction "complete befooling," and not know that he has been rude, there is but little to be said beyond an expression of commiseration of the crass obtuseness which must exist. It is bad to be rude; but it is simply unfortuuate to be so and not know it. Perhaps, even still, Mr. Cramb may be unwilling to take our word for it that he has been rude, and we must, therefore, refer him for confirmation to the courteous and sensible article of the editor of the journal in which his papers have appeared. As Mr. Cramb has referred to his national motto, apparently as a plea in mitigation of puuishment, we may commend to his attention some lines from his national poet:—

"Oh, wad some power the giftie gie us
To see oursels as ithers see us!
It wad frae mony a blunder free us,
And foolish notion."

ART-PHOTOGRAPHY.

An interesting paper on this subject was recently read before the Birmingham Society, by Mr. J. T. Brown, jun. The subject, as our readers know, possesses a peculiar interest to us, and, as we believe, to them; we shall, therefore, make a few extracts from Mr. Brown's paper, as it appears in the organ of the society, and add a few remarks of our own in passing.

An important part of this paper consists of an examination and comment upon Mr. Hughes's comprehensive epitome on the same subject, read some months ago at the South London Society,* and some exception is taken to an aphorism there announced, to the effect that "He is the highest artist who produces the greatest results with the smallest means." Now we have no desire to be the exponent of the exact meaning of Mr. Hughes's aphorism, but we apprehend that the idea just stated can scarcely be intended to be taken in an absolute or literal sense. It is the misfortune of all epigrammatic or aphoristic remarks that they convey, from their very terseness, too much or too little, and, if taken literally, require qualification or explanation. The remark just referred to, taken in a general sense, conveys a truth which few people will deny; but if pushed very literally, might be made to equally exalt the maker of [illegible] and with [illegible] the pictures traced with a red-hot poker on a panel of wood. Mr. Hughes was deprecating a tendency to regard a composition-photograph as worthy of especial attention or interest because it was produced from several negatives, and not because of its intrinsic excellence. Now we apprehend the truth is that neither paucity nor redundancy of appliances have any claim to be regarded in the estimate of a picture's excellence; they can only be admitted on the one hand in mitigation, or on the other in aggravation of censure, in case of failure or shortcoming. Perhaps a more comprehensive aphorism is that which defines the highest art as that which conceals the art, and leaves the spectator only possessed by the excellence of the work, without a thought to throw away upon the means by which it was produced.

The "smell of the lamp" can in no case be a recommendation; and in applying this idea to photography we may remark, that some of the best works of both Rejlander and Robinson leave the critics in doubt as to whether they are from a single negative or composition-photographs. We must, however, proceed with Mr. Brown's remarks. After a few introductory remarks on the aphorism of which we have first spoken, he proceeds:—

Before entering upon the question of Literal or Art-Photography, I will explain my views of art, which, summed up in a few words, consist of a "poetic" translation of the beauty and poetry of Nature, as rendered to the perception of the human mind through the medium of the sense of vision; and whether embodied upon canvas by the "artist" proper, by the mechanical aids at his command, or by the "artist-photographer" upon a chemically-prepared plate, with much less mechanical labour, through the means of his camera, yet both are dependent upon extraneous assistance—"mechanical"—whether manipulatory or otherwise.

If we take the whole scope of modern painting, and apply Mr. Hughes's test, we shall be compelled to award the palm of greatest excellence to Turner and David Cox, as in their works they have achieved stupendous results with an outlay of mechanical means marvellously small; while the followers of the pre-Raphaelite school—who have, I believe, by a strict and minute attention to the productions of photography, tended in a great degree to produce a higher interest in their profession than artists generally were possessed of before—would, from the extensive manipulation upon their pictures, be degraded to the lowest position. This would obviously be unfair. While I cannot but admit the productions of Turner or Cox to be the result of a more intimate knowledge of the mechanical means at their command, combined with an aptitude for converting that knowledge to its proper and natural use, I cannot condemn the fact that the study required by the observer to fully comprehend the subject-matter of the picture more than compensates for the extra labour or outlay of "mechanical" means they would have been required to render [illegible] more clearly apparent. In the pre-Raphaelite school the opposite principle has been adopted, and I believe we may not look upon the wonderful manipulation of most of that class of paintings without regretting how so much valuable time has been wasted by the artist that might have been turned to better account. In this particular photography will ultimately take the place of painting.

I have here a stereograph of a bit of scenery, "Trees and [illegible] Foliage." [illegible] would not have [illegible] a year beneath his pencil, though the time required to perfect it by the means at the artist's disposal, a finished picture of this bit of nature would have cost [illegible]. But the artist-photographer, provided with his camera and prepared plate, may produce in a few seconds, what to the painter would be a labour of months. And how much more faithfully! Colour only would be wanting; and in this the most important item, photography is at fault. While we can render the [illegible] aspect of nature—and the artist-photographer must not [illegible] to his [illegible] the use of the pencil is [illegible] to us, [illegible] the effects of photography [illegible]—still I am not without hope that we may, by a more careful analysis of the photographic power of colour, chemically applied, remove this difficulty, and place photography in a still higher position than it has yet aspired to.

I have also a set of stereographs, "Views upon the Avon," taken during the recent frost by one of our members, Mr. [illegible], which, although literal photography only in its lowest form, still shows that the appreciative powers of the artist have been employed, not only in the selection of the views themselves, but in the application of the art to copy the representation of nature therein displayed, as a memento of a scene which, for poetical beauty, has seldom been equalled. They also exhibit the superior powers of the artist-photographer over the artist. Had the latter wished to depict the sublimity of the scene, he would have utterly failed from the amount of time required to perfect—even were such perfection possible in human hands—a transcript of the view before him. But the former, by a simple movement of the cap of the lens, so as to expose for a few seconds his prepared film to the photogenic influence, receives an impression perfect in all its details, and still more perfect when viewed stereoscopically.

We must here interpose a remark. Mr. Brown refers to these views on the Avon, during the frost, which form a memento of a scene which for poetical beauty has seldom been equalled, as "literal photography in its lowest form." Surely he has entirely misunderstood the whole scope of Mr. Hughes's definition of literal or mechanical photography, when he applies it to the pictures he describes. In describing art-photography, Mr. Hughes observes, "In landscapes, the artist may select the period of the year, the condition of the weather, time of the day, point of sight (or view), length of exposure, &c., as artistical agencies in modifying his picture." In these winter scenes on the Avon all these conditions of art-photography, according to Mr. Hughes's definition, have been fulfilled. Mr. Brown himself adds:—

I am, therefore, disposed to class these productions among those of art-photography; but would, with all deference, throw out the hint, not only in the instance in this but in other cases, that where the poetical sublimity of Nature is aimed at, it would be well to dispense with the introduction of figures, which generally appear to be posed for that particular operation, and, to the educated eye of the artist, mar the effect.

Mr. Brown then proceeds to speak of the legitimacy of producing skies in photographs by the use of two negatives. He says:—

I maintain—and I think justly—that the artist-photographer, having met with a scene, and a sky which, in his judgment, is suited to that scene, [illegible] would be fully justified in [illegible] the cloud or sky, as it might be, to the plate and the landscape [illegible]. The [illegible] beauties of the one might be preserved intact, and a better opportunity would be afforded to obtain the [illegible] of the [illegible]

* See Photographic News, page [illegible] of the present volume.

He adds further:—

Again, Mr. Hughes cannot undertake to say that the natural sky is at all times that best suited to the picture. From some peculiarity of tone in the distance, the foreground, or the principal object in the view operating upon the chemically-prepared film in a manner far differently to the photographic effect upon the visual organ of the artist, a want of harmony would be produced; and, unless the artist-photographer has been educated to a fine appreciation of the photogenic effect of colour upon the chemicals he is generally in the habit of using, it is almost impossible, unless in rare instances, for him to produce upon a single plate the natural harmony of the scene.

The position maintained by Mr. Brown is that assumed by Mr. Fry. The same privileges are claimed for the photographer which are accorded to the painter. The latter, in painting a landscape, sees, during the progress of the work, the same scene of hill and dale, wood and water, frowning rock or grassy slopes, under a variety of aspects of light and shadow; a hundred fantastic clouds flit over it while he paints: all of these he cannot paint, but he selects and combines these effects so that whilst unity, harmony, and truth are not violated, a picturesque whole is secured. Can the photographer do this? Success is here, as in many other things, the touchstone of legitimacy. Mr. Hughes says in answer to the question, can we do this? "Let us hope we can. Let us try; but bear in mind, mere printing clouds into landscapes is not making perfect photographs. A fine photograph of clouds and sky is one of the most beautiful we can depict; but to join it on to a landscape without having a most tender regard for the nature of the subject, instead of raising the photographer to the rank of an artist, will only degrade him to the level of a mechanical printer." Mr. Hughes maintains that the highest claim of photography consists in its inexorable truth, and that composition-printing or "patchwork" tends to destroy that truth. In incompetent hands assuredly it does so; in the hands of the true and cultivated artist we think as assuredly it does not. But as mere "patchwork" is very simple and easy, it is as likely to fall into incompetent hands, or more so, than into the hands of the true artist, we think, there is indeed important need of an indignant protest against the idea that a print from many negatives necessarily constitutes an art-photograph. It is quite certain, that the true artist will not be likely to work with complex means, when simple ones will avail. What is required amongst photographers is an intelligent apprehension of the end to be attained, and of the simplest means to that end. In other words, more art education, more art culture to apprehend the object to be attained, more complete familiarity with all the powers and appliances of photography to compass the object desired. On this subject Mr. Brown observes:—

But, not only does the art of photography require further culture—whether in its artistic, chemical, or mechanical departments—we must, to render photography an art, educate our operators to that profession. A photographer may take a portrait or a view which shall exhibit a large amount of artistic feeling on his part; but if he had received an artistic education—if he had studied the harmonies of nature apart from photography—I maintain, with Reynolds and others, that he would not produce a picture wanting in artistic feeling. But, while he applies all his energies to art, he must not forget science. However artistic a man may be, he will often be foiled by apparent failures which might have been overcome had he been "up" in his chemistry or optics.

In other words, to secure the highest success, the cultivation of the photographer must be complete as a whole, in every branch of the Art and Science of Photography.

THE TANNIN PROCESS.

BY MAJOR RUSSELL.

Having experimented a great deal with the tannin process ever since I first thought of trying it, about nine months ago, I think I can throw some light on the means of avoiding the difficulties mentioned in your last number as attending its manipulation.

In the first place, my experience leads me to prefer a new collodion, giving a rather horny film, to an old and powdery sample. Every kind of collodion I have tried, old or new, thick or thin, would give good results with proper exposure, but the new is much more sensitive than the old; its use in my hands is attended with less mechanical difficulties, and the film, when dried, is much stronger and less liable to injury in printing. In fact, the suitability of a new collodion to this process is one of the greatest advantages it offers. For some purposes it may be desirable to keep the collodion a little time after iodizing, or to mix a little old with it, but it is better that the film should not be rotten or powdery.

The good effect of a bromide in the collodion is very marked in this process; both sensitiveness and facility of development are much increased by its use, and it renders less silver necessary to obtain sufficient density. The hardness of the negatives obtained from simply iodized collodion, results from under exposure, plates so prepared being very insensitive. The bromide should be used in much larger proportion than is usual; a course of experiments carefully conducted for the purpose seems to indicate that two grains of bromide to three grains of iodide is about the best proportion. Bromide of cadmium is to be preferred, on account of its great solubility in absolute alcohol.

I cannot imagine the cause of stains, unless it be insufficient washing of the plate to remove the nitrate, for in hundreds of trials, under all sorts of treatment, I have never seen anything approaching to a stain, except once, when the plates were, for experiment, slightly washed in distilled water. My practice is to put the plates, as soon as excited, into a dish of distilled water, removing them to a second dish of the same one by one when the first is full, placing fresh ones in their place in the first dish; when the second dish is full the plates are removed in the same manner into a dish of common water. Whilst each plate is in the exciting bath, after the first two dishes are full, one is removed from the second to the third dish, and another from the first to the second, so that no time is lost. Twelve plates may thus be easily excited and washed in an hour. The use of the distilled water is to remove most of the nitrate, and so prevent the violent decomposition and consequent adhesion of insoluble salts of silver to the film. The plates should not be less than a quarter of an hour in common water, half an hour is safer, and they may remain there much longer, if convenient, without any injury. I can detect no difference whatever between the quality of plates prepared in this way and of others soaked in strong salt and water, provided the salt be thoroughly washed out. If the dish of common water contains many plates, as soon as it is full the last placed in it will be ready to be coated with tannin solution. The surface of each plate should then be rinsed with distilled water, the back wiped dry, and the plate placed on a levelling stand, and the solution poured on and off once or twice; it should then be left covered with the solution whilst two more are treated in the same manner and left on two other levelling stands; the first will then be ready to be reared on one corner on filtering paper to dry, and another may take its place, and so on in succession till all are finished. It is not necessary to dry by artificial heat, but if this is done, the plates should not be exposed to the light of even a dull fire, as they are easily affected in this way.

With regard to the mechanical difficulty, my practice has usually been to coat the glass with gelatine; this entirely prevents all blistering or loosening of the film during development and fixing, unless the collodion be very unusually thick. If this plan be followed, it is as well to use fresh hypo, to which has been added a little tannin solution, so the film may retain no more of blistering after fixing, especially if the collodion be thick, or old and powdery. The use of the gelatine coating involves very little additional trouble, if properly and systematically done. The plates need not be cleaned with quite so much care as usual, and a large number may be coated with gelatine in a very short time, and stored, when well dried, in a tin box with paper between the extreme ends to prevent contact. In this state they may be kept any length of time in a dry room, and are ready for use on polishing the surface for a few seconds with a dry cotton-velvet rubber. Gelatine used in this way does not appear to injure the bath, at any rate for this process.

The whole preparation involves much less trouble than the collodio-albumen, even when the gelatine is used, but this is by no means necessary if the following precautions be attended to: either before or after exposure, the extreme edges of the plate should be varnished with a small brush and spirit varnish, which should be rather thick, to avoid risk of splashing on the surface. To develope, the plate should be placed on a levelling stand, and a little distilled water poured on it and spread over the surface with a perfectly clean glass rod, taking care not to touch the film except at the edges. On the application of the water the film expands so strongly that it is driven up in ridges all over the plate. If the development be commenced immediately, there is risk of breaking the film, especially if the collodion be old and rotton, besides which, the developer accumulating under the ridges will show in fine dark lines in the negative. If, on the other hand, the water be allowed to remain when spread over the plate for ten or fifteen minutes all will go well, in that time the film will have contracted again sufficiently to remove the wrinkles, and the contraction will continue during development, so that it usually lies quite flat by the time it is finished, and, contrary to what occurs in some dry processes, the film will adhere again to the glass perfectly.

I cannot yet say with certainty of what strength the tannin solution should be, but it is not of much consequence; ten grains to the ounce is quite enough to give very good results, and I have used it as strong as thirty grains; there are some advantages, and some disadvantages in using it so strong. Gallic or pyrogallic acid may be used to develop, the former requiring a longer exposure and giving a greenish colour, but both should not be used on the same plate, either mixed or one after the other, as this treatment is apt to cause red discoloration in the transparent parts of the negative near the sky, especially when a strong solution of tannin has been used.

The method of development published by Mr. Hardwich gives great advantages with dry plates;* not only can a large quantity of silver be used if necessary, without causing turbidity, but, in the case of an under-exposed negative, if a small quantity of silver be used, the half-tones come out much better, on account of the little acid present, than when the common plan is adopted. I think it better to make the pyrogallic solution rather stronger than recommended by Mr. Hardwich, 96 grains to the ounce of anhydrous alcohol, with a few drops of ether. The bottle which contains this solution must of course be stopped well; it will keep perfectly for six months, which is as long as I have tried it. The acid silver I prefer of half the strength mentioned by Mr. Hardwich. One drop of this is quite sufficient to bring out all the details faintly in six stereoscopic plates. The best way to use these solutions is, I think, to mix one drop of the silver solution and two drops of the pyrogallic solution in enough water to cover the plate; this will bring out the impression slowly, and will show in a few minutes what treatment is required, and more of the solution can be added, as may seem to be required: the more done it appears, the more silver should be added; the less done the more pyrogallic. This treatment gives great latitude in the exposure, if two plates are exposed, one twice as long as the other; with the same light and subject, it is easy to make the longer-exposed one appear less done than the other.

I have not yet tried the keeping properties to any extent, but have kept the plates a month before exposure, and six weeks more before development without any deterioration. Should a slight dulness appear on parts of the sensitive plate, from insoluble salts of silver, it may be removed by rubbing the surface when quite dry, with clean cotton wool, and dust may be removed in the same manner before putting the plate in the slide.

* Mr. Hardwich recommends the use of the following developing formulæ in this process: a solution of 72 grains of pyrogallic acid in one ounce of alcohol, which will keep good for months; 30 minims of this is added to three ounces of distilled water. This is the developing solution. Another solution of 20 grains of nitrate of silver and 20 grains of citric acid in one ounce of distilled water. From 10 to 20 minims of this are added to three drachms of the developing solution before applying it to the plate. If the plate appear under-exposed, the quantity of pyrogallic solution is to be increased and strengthened; if the plate appear over-exposed, then more of the citro-nitrate solution is to be added to give vigour to the otherwise feeble image.—Ed.]

THE LIME LIGHT.

Preparation of the Gases.

For the benefit of the uninitiated, I will endeavour to describe the method of making the gases, on a small scale, to produce the lime light.

When either gas is made upon a large scale, if I may so express it, several very different processes are used; but in these cases large furnaces and retorts are required, similar to the present gas-works for producing the carburetted hydrogen. For instance, oxygen is made from manganese, and other substances, which require nearly a white heat, and all these methods are more or less expensive, so much so, indeed, that though the production of cheap oxygen has long been a great desideratum, the apparent impossibility of ever procuring it in an inexpensive manner, has deterred practical chemists from investigating the matter. It is truly said, that the age of invention is in its infancy, and it is curious to look back upon the days when the producer of the first gas-light was thought a wizard, and the first steam-engine something awful to contemplate—yet with what different ideas we see these things now.

But to return to our subject—I may observe, that at last cheap oxygen has been discovered, and the residue, after its production, is twenty-two times the value of the original cost of the material used. Hydrogen may be obtained sufficiently pure by several methods. One is by passing superheated steam through iron borings. Another by passing superheated steam through coke. Both these methods require steam boilers, furnaces, iron retorts, &c.; and the hydrogen so produced costs only about eighteen-pence for a thousand cubic feet.

The simple methods I would recommend the amateur to adopt, are as follows:—In the first place, procure two wedge-shaped bags of the size required; they must be well and strongly made in order to withstand the heavy pressure they will have to bear. This pressure is calculated upon the area of the surface of the bag. For example—a bag measuring 2 feet each way will have an area of 4 square feet, or 576 square inches; and if the bag is 1 foot high at the larger end, multiply 576 by 12 (the number of inches) and the result will be 6,912, the half of this (the bag being wedge-shaped) will give the contents of the bag in cubic inches, viz., 3,456. It must be remembered, however, that the pressure upon the bag is not regulated by the *contents* of the bag, but by the area of its surface.

The pressure found to produce the best effect (and for photographic purposes this is what must be our aim) is about 3 ounces for each square inch of surface, or about a hundredweight for every four square feet of surface.

The pressure, as used in ordinary gas-works, is indicated by *inches of water*, calculated upon the fact that a column of water an inch square and 34 feet high weighs 15 pounds.

It will be necessary to have a large aperture to the jet used for photographic purposes, one admitting of the consumption of about 6 cubic feet of the combined gases per hour, *i. e.* 4 feet of oxygen and 2 feet of pure hydrogen.

As regards the use of carburetted hydrogen instead of pure hydrogen, I have previously spoken. This consumption of gas will guide the amateur as to the requisite size of the bags. I would recommend both to be made of equal size, and it is absolutely necessary that each should have the *same* amount of pressure upon it. It is advisable, perhaps, to state that the pressure must be put upon the bags *before* lighting the lamp, and that this pressure must not, on any account, be removed until the light is put out, or the consequences may probably be an explosion. The gas-bags are placed between two boards called pressure boards, and may be described as somewhat resembling the cover of a book, they are strongly hinged together at one end, and a kind of shelf is made at the opposite end of the upper board to hold the weights and prevent them sliding off when it is raised by the gas-bag. Midway between the hinges a portion of the boards is cut away to allow the stopcock to protrude.

Now, as regards the manufacture of the gases:—Procure a pneumatic trough and a Wolfe's bottle, which has three necks. Through one neck, pass a glass funnel, and let it reach to the bottom of the bottle. This is for pouring in the mixture of sulphuric acid (one part) and water (six parts); it also acts as a safety valve and indicator, for by it you can judge if the gas is making more quickly than it can escape into the receiver and thence into the gas-bag, with which of course the receiver is connected in the ordinary way. The second, or centre neck, is used for the admission of the pieces of zinc into the bottle, and the third neck has a bent tube passing through a cork fitted into it, the tube does not reach further into the bottle than the cork does. An india-rubber tube is passed over this glass tube and this connects it with another bent glass tube passing through the water in the pneumatic trough, and so under the glass receiver for collecting the gas as it escapes. By passing through the water it is cooled and purified. The receiver is simply a glass bell-shaped vessel with a tube fitted into the top of it, over which is passed the india-rubber tube connected with the gas-bag. All the corks and fittings must be properly luted with a paste made of linseed meal and water. The glass tubes should be half an inch diameter, and the india-rubber tubes three-eighths the diameter. Zinc is procurable at 1½d. or 2d. per pound, and sulphuric acid at the same price. Great heat is evolved as the gas is generated. The diluted acid must be poured in gradually, and more added by degrees when the gas begins to come over slowly. When the bottle is nearly full of the diluted acid, and gas has ceased to come over, it will be found more expeditious to disconnect it, and pour it away, instead of adding more of the diluted acid to it. The bottle must always contain a superabundance of zinc. When not in use all the liquid must be emptied out of it to save the corrosion of the zinc. This liquid is sulphate of zinc in solution, which by evaporation may be saved, it being of some value. When pure it is worth fourpence an ounce, but when produced as above mentioned, it contains a compound of arsenic. Its value is not sufficiently great to make it worth the while of any amateur troubling himself about it.

To make the oxygen, procure a copper retort of a spherical or other shape, having a plug fitting into it, to admit a mixture of three parts of chlorate of potash, at a shilling a pound, and one part of black oxide of manganese, at three-halfpence a pound; they must be perfectly dry and well mixed together. The plug is then fitted into the retort by a blow with a hammer. In the centre of the plug is a screwed aperture for a bent copper tube, about four feet long, to this an india-rubber tube is fixed (as before described). the other end of which is connected with a glass tube, which passes to the bottom of a glass bottle containing water, through which the gas rises as it is given off, and thus cools before entering the gas bag. The same cork, through which the last-mentioned glass tube passes, may also hold a second glass tube passing only to the bottom of the cork (so to speak), and bending over at a right angle above the cork, to this end of it the india-rubber tube of the oxygen bag is attached. The copper retort, when charged, is put upon a slow fire, or over an Argand lamp.

Previous to filling the bags, all the air must be forced out of them by rolling them or otherwise.

It is advisable to mark the bags, and keep each for its respective gas, and on all occasions to be careful that the gases are not allowed to mix before they reach the brass wire-gauze near the point of ignition.

To test the oxygen bag, should any leakage be suspected when the pressure is on, light a piece of brown paper, blow it out, and bring the smouldering portion near the suspected leakage, if oxygen escapes, the paper will burst into flame. There is no fear of explosion with the oxygen bag, unless hydrogen has been forced over into it, which is sure to be the case if the stopcocks are opened before the pressure is put on the bags, and the weights put on the hydrogen bag first and the oxygen bag afterwards. Have everything correct and ready before the stopcocks are touched.

It is well to mention, that it is not safe to take a light into close proximity with the hydrogen bag; no one can be too careful in the management of explosive gases.

When the contents of the copper retort cease to give over any more gas, let the retort cool, and then pour water into it. The mixture, although it will have been found to have caked together, will, by this means, be quickly loosened, and may then be poured away, and the retort put a moment on the fire again to dry, and then put away till required again.

Half a pound of the oxygen mixture, as above described, will produce two cubic feet of gas. S. S. B.

Scientific Gossip.

MR. NASMYTH has recently added some important facts to our knowledge of the physical constitution of the sun. He has discovered that its entire surface is composed of objects of the shape of a willow leaf. These objects average about 1,000 miles in length and 100 in breadth, and cross each other in all directions, forming a net-work. The thickness of this does not appear to be very great, as through the interstices the dark or penumbral stratum is seen, and it is this which gives to the sun that peculiar mottled appearance so familiar to observers. These willow-leaf-shaped objects are best seen at the edges of a solar spot, where they appear luminous on a dark ground, and also compose the bridges which are formed across a spot when it is mending up. The only approach to symmetrical arrangement is in the filaments bordering the spot, and those composing the penumbra, which appears to be a true secondary stratum of the sun's luminous atmosphere. Here these bodies show a tendency to a radical arrangement. Although carefully watched for, no trace of a spiral or vortical arrangement has been observed in these filaments, thus setting aside the likelihood of any whirlwind-like action being an agent in the formation of the spots, as has been conjectured to be the case. Mr. Nasmyth states that he does not feel warranted at present in hazarding any conjectures as to the nature and functions of these remarkable willow-leaf-shaped objects, but intends pursuing the investigation of the subject this summer, and hopes to lay the results before the British Association during their meeting in Manchester. In illustration of these curious facts we have had the pleasure of inspecting three beautiful drawings, one representing one of the willow-leaf-shaped objects; another the luminous surface of the sun as being entirely composed of these objects; and a third, a large drawing of a solar spot as seen on the 20th of July, 1860, exhibiting the surface of the sun as composed of these objects, also the penumbra and the bridges across the dark portion of the spot on which the exact shapes of these objects were to be seen most clearly. The image of the sun was examined by Mr. Nasmyth with a mirror of plane glass set at an angle of 45 degrees; nearly the whole of the light and heat of the sun passed through the glass, and the rays used were those only reflected from its surface. It would be a very important step for some photographer to attempt to photograph one of these objects. An enormous amplification would undoubtedly be requisite, and very perfectly ground lenses and reflector; but the usual difficulty, want of light, would not introduce any of its usual obstacles in the way of obtaining good photographic representations of these wonderful "willow leaves." It is a maxim with us, as it ought to be with all photographers, that what we can see we can photograph. These have been seen by Mr. Nasmyth, and therefore their photographic fixation should not be far distant.

Now that the beautiful phenomena of the spectra of artificial lights are attracting so much attention, it is with pleasure that our readers will learn that most of the fundamental phenomena upon which the researches of Bunsen and others are based, were originally observed and described by English scientific men. To Fox Talbot we owe very much of our knowledge of the spectra of artificial flames, and Professor Wheatstone has also experimented assiduously in this branch of physical optics. One of the most important papers on this subject was read some years ago by the Professor, at a meeting of the British Association. It was, however, never published in full, and consequently received little attention, except from those who were fortunate enough to be present when it was read. Having lately had an opportunity of seeing the complete paper, (which will shortly be published in full in the *Chemical News)* we were so struck with the beauty and originality of the experiments there described, that we hasten to lay a full abstract of it before our readers, feeling assured that the subject is one in which they cannot fail to take an interest.

The title of Professor Wheatstone's paper is "On the Prismatic Decomposition of Electrical Light," and the following is an abstract of the principal results stated in it:—"1. The spectrum of the electro-magnetic spark taken from mercury consists of seven definite rays, only separated by dark intervals from each other; these visible rays are two orange lines close together, a bright green line, two bluish-green lines near each other, a very bright purple line, and, lastly, a violet line. The observations were made with a telescope provided with a measuring apparatus; and to ensure the appearance of the spark invariably in the same place, an appropriate modification of the electro-magnet was employed. 2. The spark taken in the same manner from zinc, cadmium, tin, bismuth, and lead, in the melted state, gives similar results; but the number, position, and colours of the lines vary in each case; the appearances are so different, that by this mode of examination the metals may be readily distinguished from each other. A table accompanies the paper, showing the position and colour of the lines in the various metals used. The spectra of zinc and cadmium are characterised by the presence of a red line in each, which occurs in neither of the other metals. 3. When the spark of a voltaic pile is taken from the same metals, still in the melted state, precisely the same appearances are presented. 4. The voltaic spark from mercury was taken successively in the ordinary vacuum of the air-pump, in the Torricellian vacuum, in carbonic acid gas, &c., and the same results were obtained as when the experiment was performed in the air or in oxygen gas. The light, therefore, does not arise from the combustion of the metal. Professor Wheatstone also examined by the prism the light which accompanies the ordinary combustion of the metals in oxygen gas and by other means, and found the appearances totally dissimilar to the above. 5. Fraunhofer having found that the ordinary electric spark examined by a prism presented a spectrum crossed by numerous bright lines, Professor Wheatstone examined the phenomena in different metals, and found that these bright lines differ in number and position in every different metal employed. When the spark is taken between balls of dissimilar metals, the lines appertaining to both are simultaneously seen. 6. The peculiar phenomena observed in the voltaic spark taken between different metallic wires connected with a powerful battery were then described, and the paper concluded with a review of the various theories which have been advanced to explain the origin of electric light. Professor Wheatstone infers from his researches, that electric light results from the volatilization and ignition (not combustion) of the ponderable matter of the conductor itself; a conclusion closely resembling that arrived at by Fusinieri from his experiments on the transport of ponderable matter in electric discharges.

In a recent number of the Photographic News we gave an account of some remarkable experiments tried, and results obtained, upon a spring in Florida, from which the inference was drawn that water was almost perfectly transparent. These observations were necessarily rough, being tried at the margin of the spring, with cards, &c. Dr. Tyndall has now shown, by a series of beautiful and conclusive experiments, that water has a decided colour—that even in small thicknesses it is not the colourless substance it is usually imagined to be. When seen through a glass full of the liquid, of course it appears without colour, but if looked at through a stratum of fifteen feet its colour is very evident. The following is Dr. Tyndall's arrangement of the experiment for showing this to a large audience. A tin tube, fifteen feet long and about three inches in diameter, is placed horizontally on a stand, and half filled with water. The tube is closed by plate glass at each end, and a beam of electric light is thrown through it from the other end. By this means an image of the contents of the tube is projected on a white screen. The tube being about half filled with water, and the image upon the screen being inverted by the lens, the upper air space in the tube is seen in the lower part of the image, which is quite colourless; whilst the upper portion, illuminated by the rays which pass through the stratum of water, is of a greenish blue colour. The colour varies from a pure green up to a blue, according to the purity or otherwise, of the water. Thus it is evident that the colour of water is very appreciable, for in a stratum of fifteen feet a very considerable amount is exhibited, and thus there is no difficulty in comprehending the fact, that in looking through a deeper stratum, such as is seen in the Swiss lakes, and in the waters which we have around our own shores, this colour of water makes itself very perceptible.

AN APPEAL FOR THE PRACTICAL IN ARTISTIC PHOTOGRAPHY.

BY A. H. WALL.*

The new art has *not* reached its limits, and we societies know very well that there *is* something further to be accomplished. There is indeed *much* to be done, and that in every branch of the art. We require, and are grateful for, the labours of our opticians, our chemists, our mechanics, and our operators; but above all it is necessary that our artists should be active, inasmuch as theirs, the highest and most important branch of all, has been most neglected. We don't want abstruse theories from any of them. Such things will do well enough when we have done our more necessary work; but now every paper we read, every experiment we undertake, and every discussion in which we take part should have some practical or suggestive value.

Photographers too frequently look with an eye of jealousy upon the artist, because, regarding all art as purely imitative, they can't conceive a work of the hand and eye as more perfect than the results of a process which they regard as infallible. Hence it was that when such artists as Sir Charles Eastlake, Sir William Newton, Rejlander, Lake Price, and others came amongst photographers, mutual misunderstandings soon estranged and separated them. If an artist, venturing out of his native element into that of science made a false step, some eagle-eyed scientific photographer swooped down upon and held him up to ridicule and laughter; and if a scientific photographer, rashly invading the domains of art, advocated some glaring artistic blunder, or piece of evil taste, up rose the representative of the palette, and down went the gauntlet once again.

* Continued from p 125

Now, however, a change is taking place. We know that our lenses require artistic management, that our knowledge of pictorial science must give our chemical knowledge its real value, and that mechanical perfection helps us to artistic results only when we have the power of using such judiciously. The hand may be there, but it wants the head to guide it; the body may exist, but it wants the soul to animate it. Let us, therefore, cultivate, not this or that branch of photography, but *all* its branches. Let us aim to bring together and unite harmoniously every element of our art's success, so that our societies may be formed of artists, opticians, chemists, mechanics, and operators; bound together by their common interest in the art they love, and working out *practically* the grand problem of its ultimate perfection, undisturbed by petty jealousies, or idle controversies, and working, not with words only, but with words and *works*.

To embody the progress which may thus arise we shall look to our societies' photographic exhibitions, which will thus become the medium of communication between us and the public, and fight our art's battle against adverse critics. My sole object in this paper is to advocate the practical. To this end we need our best efforts. We must not be content with bringing this process out, and that modification forward; but rather direct our efforts towards the perfection of existing processes. Novelty has great attractions, for he who brings forward the veriest trifle of a discovery is more lauded and honoured than the steady plodder who conducts us slowly and surely onwards to perfection. Here then we want a little reform. Let the palm be given to the practically useful; the meed of honour to the doer of good things, rather than to the suggestor of idle or unprofitable experiments.

To simplify and render more certain every step in the practice of photography is one of our tasks; and here I cannot do better than quote a writer in a recent number of the *London Review*, who, writing upon "Photography as a Fine Art," says, "when its processes become more manageable, as much so, in fact, as the crayon in the hands of the painter, then will photography approach still nearer to a high place among the fine arts; for, inasmuch, as being less dependent on manipulation there will be more room for the exercise and display of the artistic faculty. Every year brings us nigher to this desired consummation," and if united by a common love of our glorious art, we all work together, as our various acquirements and experiences dictate, each labouring to perfect that element, branch, or process with which he is best acquainted, we cannot fail so to improve the character of our photographic exhibitions that the stigma of the mechanical will be laughed to scorn both by photographers and the public.

While speaking of exhibitions I may perhaps be permitted to express my very high appreciation of a system adopted by the Photographic Society of Scotland, that of awarding medals as prizes for the best photographs exhibited. The value of such prizes will of course depend upon the real merit of the qualities for which they are awarded, inasmuch as it is of course the honour implied rather than the intrinsic value of the medal, which renders them so desirable. Of course I need not, therefore, add, that while the judges, *being thoroughly able and competent gentlemen*, should be guided by the success achieved: they should rather reserve such prizes altogether than award them for acquirements or specimens of an inferior description. The greatest success of the highest nature should carry off the prize. The simple medal then, represents more honour, and is, consequently, more eagerly desired and more earnestly sought; thus best serving the high purpose for which they were intended.

In concluding these few suggestive remarks I again take up my text, and repeat that for real progress, both upwards and onwards, we must look to our practical members. Whatever we do let us be practical; we may sometimes feel when discussing a piece of mechanism, or some point of simple manipulation, that such an employment has but little dignity in comparison with the high flights we have taken into the loftiest heaven of science; but our art is a peculiar one, embracing, as I have shown in my opening remarks, the noblest and the meanest, the loftiest and the lowliest, and not infrequently the largest and most important sucesses are due to the perfection of some trivial piece of mechanical ingenuity, or some apparently unimportant improvement in manipulation. Therefore, whatever the nature of our work, let it be earnest and practical, whether it be claimed by mechanics, science, or art.

Gentlemen,—I will not now detain you any longer; already, perhaps, I have exhausted your patience, but I could not resist the opportunity of placing before so influential a society, for consideration and discussion, the few preceding suggestions. If in so doing I have made a mistake, I can only ask, what I think in consideration of my earnestness you will kindly grant, viz., a full pardon.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

We make the following interesting extracts regarding the Scottish Exhibition from the various criticisms in the Edinburgh newspaper press. The *Scotsman*, in a second notice, remarks—

"The perfection to which sun printing has attained within so very short a time is scarcely less wonderful than its origin. Being one of the latest, though not the least remarkable, of modern discoveries, many who were present at its birth still survive to witness its ripened power and rejoice in its triumphant success. The time has been, however, and that not long ago, when its merits in an artistic sense were not so conspicuous as now. The discovery of Talbot gave a new impulse to the art, and within the last few years both the chemical manipulation and construction of the instruments employed have been so much improved as to render the process almost perfect. But mechanical means alone, however perfect, are not sufficient to form a good photographer. He must, in addition, possess artistic taste and knowledge—a capacity for arrangement and composition, to enable him to place his model in the position best adapted for displaying its natural advantages, and by a skilful distribution of the chiaroscuro and appropriate use of accessories, to give it all the advantages of contrast and effect of which the subject may be susceptible. It is the possession of these qualifications which gives to the photographer the title to be called an artist. Without them, however dextrous in the use of mechanical means, he is a mere *caput mortuum*—a body without a soul. No better illustration of what has been stated could perhaps be found than in a brief reference to the art as it existed some years ago in comparison with its present state, as shown by the Exhibition now opened. Many will still recollect the hideous productions which used to be denominated portraits. If the model happened to be a clergyman or professional man, wearing a white neckerchief, what a contrast did the portrait present? The face usually of the hue of blacklead, rested upon a pillow of snow, presenting a considerable resemblance to a subject often treated by the old masters—'The Head of St. John on a Trencher.' And then, from the defective character of the instruments employed, the form was much of a piece with the colour—eyes front, nose profile, mouth awry, was the general formula of a head, and as for character or expression, such qualities were never even aimed at. It may, no doubt, be said that such abortive attempts exist even at present, but now they are the exception, formerly they were the rule, and those who produce such works now have no more right to be termed photographers than the dauber of a signpost has to be called an artist. In landscape, the results were equally unsatisfactory. These old things, however, have passed away, and photographic portraits in truth, spirit, and character, in all the main essentials of art, rival the best productions of this or any other age. The beautiful works of Claudet, Tunny, Moffat, &c., ay, even of the amateurs L'Amy and Mitchel Innes, in the present Exhibition, will amply bear out our statement, while the able and complete landscapes of Mudd, Maxwell Lyte, Vernon Heath, Annan, and many others, are not less satisfactory and delightful. Many we know have by its early specimens been repelled from the study of photography. To all such we would say, Go and see the present Exhibition, and if you have any music in your soul, it cannot fail to be called forth in tones of pleasure and satisfaction. To the lover of art, of whatever kind, we would also give a similar advice. Photography has been designated the handmaid of art; and if it be so, the present Exhibition may not inaptly be termed the vestibule to that of the Royal Scottish Academy just opened. Intending visitors to the latter should, therefore, lose no time in quickening their powers of observation, and increasing their capacity for enjoyment, by a study of the sun pictures, which afford a sure standard whereby to test, in many respects, the works of human genius. We may take this opportunity of stating that Mr. Robinson has assured us that his two beautiful photographs of a 'Holiday in the Wood,' and 'The Top of the Hill,' are both the productions of last season; and we are now satisfied that our recollection was at fault in stating that the former had been seen previously by us. It was another work by Mr. Robinson which ran in our mind and caused the mistake."

The *Caledonian Mercury* has the following remarks :—

"The picture which has received the greatest share of attention, is No. 65 in the catalogue, entitled 'A Holiday in the Wood,' the artist, who is likewise the exhibitor, being Mr. H. P. Robinson. It is the largest figure composition ever attempted in photography. A group of merry girls and boys are disporting themselves on a grass-knoll on the borders of a leafy grove. One is in eager pursuit of a butterfly; another crowns a companion with a wreath of summer flowers; a third laughs at the story or jest of one of the little group seated near in the long deep grass. Not one of the many figures represented has the slightest appearance of having sat for his or her portrait, and the grouping and arrangement are most artistic. The landscape is full of air and sunshine. The leaves and grass are instinct with rustling life, and the eye wanders with delight through the deep and transparent shadows of the grove, away to the distant gleams of the bright sky beyond.

"The Exhibition is particularly rich in studies of trees. No. 314, 'A Lane Scene' (collodion) is executed and exhibited by Mr. J. Dixon Piper, who contributes nine pictures, all worthy of high praise. The 'Lane Scene' is made of the simplest details—a few trees, through whose branches the bright sunshine falls on a woodland path leading to a picturesque field-gate. The alternate light and shade, besides the fidelity of their rendering, assist in giving a deep perspective to the back ground which peeps from behind the bars of the sun-flecked gate. No. 298, 'Study of Trees' (collodion), and No. 391, 'Chesnut Tree' (collodion), are by the same artist. The subjects are well chosen, and truthfully treated. The foliage of each of them is free from the woolly appearance sometimes seen in photographs of grass and trees. Each leaf is distinct, from the grass blades of the field up to those that

'Dance so light, and dance so high,
On the topmost bough that looks up to the sky.'

Perhaps the finest realisation of forest scenery in the Exhibition is No. 291, 'Pass of Killicrankie' (col. albumen), by Mr. James Mudd, who is the artist and exhibitor of eighteen pictures, all of which are certain to become public favourites. In the above picture is represented a dense forest of pines, in the centre of which is embowered a cottage which breaks up the monotony of the countless trees, whose tops rise and fall in graceful undulations, until lost to sight behind the downward slope of the pass.

"Mr. J. H. Morgan is artist and exhibitor of six pictures. No. 376, 'The Rising Mist,' (collodion) is a perfect gem. In front is an ancient bridgeway, across which the sunshine, streaming through the tree tops, falls in many patches of light. Beyond the bridge a clump of trees is dimly seen through the mist. Sometimes similar misty effects are the results of imperfect development, but minute examination will prove that this is the veritable presentment of a summer haze.

"Mr. Vernon Heath, the artist and exhibitor of fourteen pictures, is particularly happy in the pleasing tint which pertains to all his photographs. Of these we prefer the four pictures numbering from 56 to 59 (collodion); the first, a view 'On the Cornish Bank of the Tamar,' is our favourite. In one or two pictures the foreground is rather confused and misty, and the water—but what league of lens and sensitized plate ever could catch the limpid transparency of leaping stream or rolling river—is (for want of a better word) cottony.

"Mr. T. Annan is the artist and exhibitor of fifteen pictures. No. 276, 'Aberfoyle' (collodion), is one of the most charming photographs we remember ever to have seen. It is balanced with due regard to artistic rule, and is in keeping with the subject and the season. In the centre of the picture is the Clachan, consisting of two cottages, immortalised by Sir Walter Scott. The rude masonry of the one and the white plastered walls or the other are given with minute distinctness and without glare. A heather-covered brae slopes upwards to the right of the Clachan. A peat-cart is introduced midway this ascent, and its white shafts and wickey-fashioned sides carry up the light in a graceful line to the patch of fleecy cloud which overhangs the strath. Across the middle distance runs a long range of bosky hills, and behind rises 'broad Benlomond,' in solitary grandeur. Another of this artist's pictures, No. 280, 'Inversnaid Waterfall,' is, with the exception of want of sparkle in the foam, excellent; the lichened rocks and boulder stones, the unquiet pool beneath the cascade, and the calm water of the pool lower down, are true to nature. It is to be regretted that these pictures are not 'untouched' photographs.

"Dr. Walker, one of the Council of the Society, is the artist and exhibitor of two photographs, Nos. 304 and 305 (waxed paper), and twelve stereograms. Of the two pictures we prefer the latter, entitled 'On the Esk, Dalhousie.' This river, the most picturesque of Lothian waters, is a peculiar favourite of painters and photographers, and its shady, sunny nooks, long ridges of sand and rock, lazy pools and wooded banks, are characteristically rendered in Dr. Walker's picture. The tint is pleasing, and closely resembles that of Mr. Vernon Heath's best photographs. In strong contrast to the foregoing landscapes is Mr. Maxwell Lyte's, No. 296, 'Cirque de Gavarini' (collodion), a weird-like scene well fitted for the orgies of a Walpurgis revel. On either side of a deep gorge, through which rushes an impetuous torrent, rise frowning precipices, and above and behind the glaciered and snowy Alps. We experience a sensation of chill and terror looking on these inaccessible cliffs, crowned with perpetual winter and clothed with drizzling mist. All these features and effects are forcibly given in this picture. No. 28, 'The Falls of Terui,' photographed by Mr. R. M'Pherson, and exhibited by Mr. G. Thomson, is very bold in treatment; but the picture is marred by the sombre tint of the rocks, which gives the view the appearance of a cascade tumbling into a dark cavern. William Church, junr., contributes only one picture, No. 266, 'On the Gareloch.' Although the work of a non-professional, it is one of the best second-rate landscapes in the Exhibition. The shelving pebbly beach, laid bare by the tide, is extremely beautiful. The tone of the picture is however deficient in warmth, and the sun has been assisted in his 'cloud painting.'"

Proceedings of Societies.

Manchester Photographic Socuty.

The monthly meeting was held on Wednesday the 6th inst.—Joseph Sidebotham, Esq., in the chair.

After the election of some members, the presentation of some reproductions by Mr. Brothers, and some other routine business,

Mr. Sidebotham vacated the chair, and read a highly interesting paper on some of the causes of distortion in photographic portraits. We make an abstract of the paper as it appears in the organ of the society. After referring to the admitted varieties as likenesses, which different photographs of the same person often presented, and the unquestionable defects and distortion which often prevail, he proceeded:

Sir David Brewster and others maintain that the correct aperture with which to take a portrait should be a very small one—as small, if possible, as the pupil of the human eye; others contend that a lens, or combination, of large aperture should be adopted, not only as increasing the rapidity of action, but as also giving greater roundness and prominence to the portrait.

Let us examine portraits taken under both these conditions; and, first, that taken with the small aperture. You can find no positive fault with it; but there is a flatness about it, and you perceive at once that it is not satisfactory. It is in fact like looking at your friend's face with one eye, and to a person who is unfortunately furnished with but one, would no doubt be pronounced an admirable likeness. Look at portraits taken with a lens of large aperture. They have not the fault of being flat, but stand out extremely well. Still the features do not appear correct; there is evidently *distortion*, although we cannot exactly find out *where* it exists.

It would appear then, that neither the small aperture or the large one give accurate portraits; in fact neither looking at a friend with one eye, or looking at him with a number of eyes, arranged in a circle of three inches in diameter, would give us the same result as we have by looking at him with two eyes.

If we take a small cube, of an inch in diameter, and take a photograph of it, using a small aperture, or what is the same thing, look at it with one eye—we are able to place it so as to see three of its sides. If we use a large aperture lens, we can so place it as to take a picture showing five sides; but if we look at it with both eyes we can only see four sides.

Let us now see if this does not assist us in solving the problem. To depict the portrait on a flat surface as seen from a single point, the small aperture is no doubt correct. But we want a *likeness*. We do not care for the mathematical precision. We want a picture of our friend's features as they appear to us.

To take a portrait so as to give the likeness the same as we see with both eyes, we ought theoretically to use a diaphragm with two small openings, one at each margin of a three-inch lens, arranged horizontally like the eyes. In practice this does not answer, as the two apertures yield dissimilar pictures, which, although falling on each other, do not blend together to form one image. But we can produce a modification of this, which removes the difficulty, and it appears to me this is exactly what we require.

Mr. Sidebotham then stated that his own plan was to use a slit-like diaphragm, giving the extreme limits of the vision of each eye in a horizontal direction, and entirely cutting off what might be termed the *vertical* stereoscopic effect, which was the cause of so many unpleasing portraits. Thus getting the roundness of figure, as in the large lens portrait, reducing the amount of distortion to a minimum, this would obtain copies of their friends' faces, as they saw them, and produce perfect photographic portraits.

Mr. Sidebotham's paper was illustrated by diagrams and the exhibition of specimens.

Mr. Brothers was quite aware that distortion was frequently seen; but he believed that much depended upon the lens used, and he thought, if operators were careful in their choice, that most satisfactory portraits might be taken with a large aperture of the ordinary character.

Mr. Sidebotham remarked that the question of good and bad lenses did not bear upon his argument. In order to test his theory, any lens might he employed, and its capabilities ascertained with the ordinary stop, as compared with the arrangement he proposed. His argument was briefly this: that in taking a portrait with a small aperture the rotundity is lost, because the effect is that which we should get by viewing the object with one eye only. If a large aperture were used, then the rotundity was obtained; but distortion arose from the fact that a stereoscopic effect, in a vertical direction, exists. With his form of stop the picture was taken by an aperture corresponding to the arrangement by which they perceive the sitter.

Mr. Brothers doubted whether he should be able to work in his glass-room with so narrow an aperture as that recommended.

The Secretary said that Mr. Sidebotham's theory carried truth with its enunciation. It appeared to him to be one of those things that was simple enough when found out, but which everybody had been in search of until then without success. In reference to Mr. Brothers's remark that there would be a want of light, he observed that, to carry the principle out perfectly, the opening should of course be the diameter, in a vertical direction, of the pupil of the eye, and the length the distance of the eyes apart; but in practice these dimensions might probably be enlarged without any perceptible loss of truth.

After some further conversation the discussion was adjourned.

Mr. Noton then described a new plate-holder which he had invented.

After some further conversation on this subject, and an explanation from Mr. Hooper regarding a transaction in connection with the panoramic lens, the proceedings terminated.

Photographic Notes and Queries.

Stereo-Exchange Club.

Sir,—You would confer a favour upon myself and many others of your more recent subscribers by publishing the names of gentlemen desirous of exchanging stereograms. Might I suggest that you certify your intention of doing so on a particular day, and request that *a fair average print* be sent to you, for approval, by each person desirous of having his name inserted. The accompanying stereogram was taken under unfavourable circumstances, and was, in fact, only intended as an experiment, in order to test the powers of a pair of Ross's lenses, which I had just received.—I am, sir, yours, &c.,

Langerig Hall, March 18, 1861. C. F. B.

[As soon as we receive a sufficient number of names, we shall publish another list. Those of our readers who may be anxious to avail themselves of the advantages of this exchange, will please to forward their names and specimen prints.—Ed.]

Yellow Glass for Dark Rooms.

Dear Sir,—I notice in the Photographic News of to-day a letter respecting yellow glass, from which it appears there is some difficulty in procuring a thoroughly-suitable tint. As I have always manufactured my own, and found it completely satisfactory, I send you my plan, which may perhaps be useful to some other photographer. I dissolve 1 oz. of shell lac, 1 drm. of gum elemi, and 1½ oz. of powdered gamboge, in 6 oz. of vegetable naphtha; when the gums are quite dissolved, which will be in a day or two, decant the varnish off the dregs, and apply to the glass—quite dry and rather warmed—with a broad camel-hair tool. It will be dry in a few minutes, and may then have another coat, or more if requisite, to give the desired tint. This glass transmits a good softened yellow light, I believe quite non-actinic. There is also the advantage that the varnish can easily be applied to existing windows, lanterns, &c., if desirable.

Does "Hardwich's Manual" give the routine of the principal photographic processes—positive and negative collodion, printing, copying, &c.? I think it would be to their own advantage if he and other publishers were to ventilate their new editions in your advertising columns a little more freely. I have been looking out for a handbook bringing up processes to the present time; but till I saw your article on the "Tannin Process," I was not aware that one had recently come out.—I remain respectfully, J. J. Larriston.

The Abbey, Wigton, March 16, 1861.

["Hardwich's Manual" is a very complete epitome of most of the collodion processes.—Ed.]

Panoramic Photographs—Tannin Process.

Sir,—It may be useful to some of your readers to know of a means of taking small panoramic pictures, *i. e.*, double the length of a stereoscopic picture, without going to the expense of the panoramic apparatus.

I have taken a few upon stereoscopic dry plates, of which the enclosed is a specimen, by exposing first one view, say the right on the left half of the plate, then moving round the camera and taking the other half in a similar way.

If the two are made to meet accurately in the middle, there will be very little line visible in the print.

In order to view them to advantage, I have made the lenses of my stereoscope to slide out and reverse, so as to use them as an ordinary lens, or pair of lenses, for viewing these pictures. My stereoscope has a screen between the lenses and the picture, with two apertures in it through which to view stereographs, but hinged so as to shut down when using the instrument for single pictures.

It is astonishing how important the picture looks when viewed in this way, and how well it bears magnifying if taken from a sharp negative.

In order to shield myself from the attacks of artists on the one hand, and panoramic lens makers on the other, I beg to say that I am perfectly well aware that the laws of perspective are set at defiance in thus uniting two pictures, and, therefore, the subjects must be judiciously chosen.

In such subjects as the one sent I suppose no one could *see* that the perspective is incorrect, therefore the knowledge of its *being* so need not make one unhappy.

The picture is taken by the tannin process, which may be truly said to beat every other preservative, as far as my experience goes, and for the publication of which Mr. Hardwich deserves the thanks of the photographic world.—Yours obediently,

Cheltenham, March 15, 1861. G. S. Penny

P.S.—Some photographers having been once intoxicated with the gin and water preservative process, your teetotal photographic readers may be exhilarated by the information that their favourite beverage, which in the cup is allowed to "cheer but not inebriate," may with advantage be also served upon a plate.

I announce this discovery, lest any enthusiast might be induced to take out a patent for this new mode of "dishing-up."

Seriously—I have prepared a plate in all respects as for the tannin process, only substituting, as a preservative, a strong infusion of black tea. The plate was exposed under a negative to artificial light, and yielded a very good print, bearing in every respect a strong resemblance to a tannin plate, to the presence of which chemical it no doubt owes its virtue.

G. S. P.

[It is somewhat singular that our friend and contributor Mr. Hannaford made the same suggestion to us a few days ago, whilst enjoying a cup of the said beverage. Regarding the panoramic picture forwarded, it is most charming; the subject is one in which the error in perspective does not attract attention, and what is lost theoretically in this respect is more than made up in the extent of angle gained. Such pictures make us more anxious to see the panoramic lens in general use. As a photograph, this is the best we have seen from a tannin plate. In this respect nothing could be better.—Ed.]

Printing Difficulties.

Sir,—The incessant changes rung on the difficulties of printing with unvarying success on albumenized paper, induce me to offer a few remarks on a source of perplexity and annoyance which I have no doubt has puzzled others as well as myself. I allude to a condition of the printing bath, which sometimes appears, although consisting of several ounces of nitrate solution, to lose, somewhat suddenly, the power of giving vigorous prints. My own bath contains ten or twelve ounces, with originally eighty-five grains of fused nitrate of silver to the ounce. On first preparing it, I added a few drops of acetic acid, just sufficient to show a faint reaction upon test paper. After sensitizing about a dozen pieces of paper, 6½ by 4¾ inches, I found all the indications, in the three or four last sheets, of a weakened bath. I could scarcely conceive, with a bath of the size and strength employed, that the abstraction of the silver, by its conversion into chloride, would produce sufficient dilution, to account for my failures, and my opinion was confirmed on pouring the contents of the bath into a glass measure, sufficiently deep to allow of my using a small hydrometer, which soon settled at nearly eighty grains of nitrate of silver to the ounce. On pouring the bath into the measure I saw at once that its contents were not of equal density throughout—that, in fact, the *lowest* stratum of solution not having been disturbed by the process of sensitizing, maintained its normal density, whilst the upper being so repeatedly robbed of its silver, became sufficiently reduced in strength to account for loss of vigour in the prints. On returning the bath into the glass dish, the prints subsequently taken showed all the vigour of the first. The obvious remedy, therefore, for a bath in this condition, is occasional agitation to promote uniform density.—I remain, yours very truly,

Welland Ford, March 18, 1861. H. Fitzroy Pelham.

Glasgow Photographic Society.

Dear Sir,—That you should have been puzzled at the reports of our meetings, I do not wonder; for my own part I feel considerably at being obliged to address you on this matter, but I am bound to make some explanation as to my position.

At the outset it will be necessary to explain that Mr. Cramb is not only the secretary of the society, but the only reporter, even when he himself is actively engaged in the discussion. I now state a few facts which will shew how I have been made to play so ridiculous a part. At the meeting on the first Thursday of February, when Mr. Cramb read his paper on the silver meter question, he and his brother called on the meeting to witness the experiments, if they were what might be called correct. The first was to measure out one drachm of my silver bath; he having done so I remarked that the measure contained more than a drachm, others coinciding in my opinion, *three* drops were then removed, and the meeting was then satisfied that the measure contained only one drachm (mark, three drops out of one drachm) after they had insisted that the first measure was correct, (so much for the *accuracy* of the experiments). I then asked whether they had tried the temperature of the solutions before using the hydrometer, and was told *no*; but that the temperature of the room was about 60°, and *consequently* that of the solutions should be the same. I then said that unless they were certain that the solutions were at 60° when tested by the argentometer, the experiments were valueless.

I am also represented as having said, that I considered the silver meter useless as a test for old baths, while I only said it was useless for *old collodion baths* highly charged with ether and alcohol, (I have always used the argentometer for my printing baths, and consider nothing could answer the purpose better).

As I had not then read Mr. Hughes's paper, I asked Mr. Cramb whether he considered Mr. Hughes's remarks had any reference to what he had said on a previous occasion, and was answered in the affirmative—Mr. Hughes having even quoted Mr. Cramb's words. I then proposed a vote of thanks to Mr. C. for his experiments, and said I was glad the matter had fallen into such able hands, for I was satisfied that no member of our society could use the tongue or handle the pen better than he could.

As to the report of our adjourned meeting on the 14th, it would be simply ridiculous to enter into any explanation of it, as it does not do justice to those gentlemen who differed from Mr. Cramb.

Mr. Macnab, at our last meeting, spoke of this report as being "garbled, one sided, and false," which opinion I most cordially endorse.—I am, yours truly, John Stuart.

120, *Buchanan Street, Glasgow, March* 20, 1861.

[We are glad Mr. Stuart has done justice to the Glasgow Society, which numbers amongst its members some photographers we highly esteem, and relieved it from the implication of endorsing Mr. Cramb's rudeness. We have, from several sources, been informed that the members generally entirely disapprove of Mr. Cramb's attack upon Mr. Hughes and ourselves. —Ed.]

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 20th March, 1861.

Photography has lately received promotion in the army. Our minister of war has decided that an officer of each corps shall be a practical photographer. In the event of a campaign this officer to accompany his corps. These officers are already appointed in the guards, and in several regiments of the first military division. There are many branches of the public service to which photography ought to be attached, and doubtless will be in due time. The war department is always first served with every new and useful invention: other departments have to employ much persuasion and influence ere they can get even the story of their wants listened to. I am not jealous that the military department should be the first authorized patron of our art, on the contrary, I think the good example may be beneficial; but I am annoyed to think that so many other departments, which might derive such important aid from photography, should be allowed to do without it, whereby the cause of knowledge and the public good are the sufferers.

I should be glad to see more specimens forthcoming from your side of the channel, as contributions to our forthcoming Exhibition; but I suppose they will all arrive at the last moment. This is bad policy, and should be avoided if possible. I hope to see British photographic art adequately represented here in May. The opportunity is not to be despised, and professional photographers, especially, will find their interest in contributing specimens.

Experiments which continue to be made on the disinfecting properties of coal-tar, are attended with very satisfactory results. For cesspools and other receptacles of decomposing matters, to which various antiseptics have been applied with equivocal success, coal-tar is found perfectly efficacious, and is now employed to the exclusion of chlorine, charcoal, the salts of lead, zinc, iron, &c.

Phenic acid, one of the many valuable substances eliminated from tar, is also employed as a disinfectant, under circumstances where the use of coal-tar might be attended with some inconvenience. It is very serviceable in anatomical preparations; it is sufficient to place the animal matter in a vessel, the interior sides of which are smeared with the phenic acid; it completely checks fermentation. Water dissolves more of this acid than is generally supposed; as much as 5 per cent. at 60° F., and this solubility may be greatly increased by the addition to the water of 5 to 10 per cent. of alcohol, or of acetic acid. The aqueous solution is useful in skin disease; it instantly destroys the *acarus* of the itch, and ringworm is cured by it. Rubbed upon the skin, it produces a rubefacient action, which continues from 15 to 20 days, without causing ulceration, suppuration, or scar. The pain it causes, lasts about an hour. This application of phenic acid may be found to advantageously supply the place of blisters.

From the numerous researches that have recently been made by many eminent chemists, it is probable that we shall soon arrive at a knowledge of the chemical constitution of steel. It has been the custom to call steel carburet, or, more properly, carbide of iron; but, since the important part that ammonia is found to play in the conversion of iron into steel, the old chemical notion has become greatly modified, if not altogether changed. Steel is obtained either by cementation, the action of carbon upon iron, or by decarbonizing cast iron by a special puddling, but the precise nature of the aceiration, or how it is effected, has never been clearly understood, nor in what the actual difference between iron and steel consists. We know, somewhat vaguely, it is true, that many substances, such as nitrogen, and organic and inorganic substances containing that element, particularly the cyanides, phosphorus, manganese, tungsten, aluminum, &c., exercise a certain influence upon the production and quality of steel, but the modes of action of these various substances, and the nature of their influence, have remained impenetrable mysteries. It has been shown a thousand times that certain kinds of iron always produce steel of the first quality, while other qualities of iron as pure, or perhaps even purer, yield steel of inferior quality. In fact, a great many interesting facts are known concerning steel, but the most important fact of all, the knowledge of its interior constitution, has remained unknown.

Still most chemists consider steel as a carbide of iron, that is, a definite or indefinite compound of iron and carbon: in this sense, steel differs from iron only by an addition of carbon, and from cast-iron by a lesser proportion of iron. The question then is, whether this opinion is well-founded. M. Frêmy, who has carefully studied the matter, answers in the negative on the following grounds:—1. Not a single experiment has clearly demonstrated that steel is simply a combination of iron and carbon. 2. No one has ever succeeded in converting iron into steel by simply placing iron in contact with carbon absolutely free from all foreign influence, such as impurities in the crucible, the action of the elements of the atmosphere, &c. 3. Every kind of steel when dissolved in acids leaves a residue which in no respect resembles pure carbon, but, on the contrary, resembles certain cyanides. 4. Of all methods of carbonizing iron, the simplest consists in submitting the iron to the action of coal-gas; now, when for a sufficient length of time, about two hours, we pass dry coal-gas upon red-hot iron, the latter is converted into a very malleable, fusible, graphitous cast-iron, comparable in every respect to the finest cast-iron produced by charcoal; but it is not converted into steel. Simple carbonization, therefore, produces cast-iron, but not steel; steel is not carbonized iron. M. Frêmy inquires whether steel be not the result of a simple nitrogenization, if steel be not nitrogenized iron: to this he replies emphatically, that it is not. Nitrogenized iron undergoes profound modifications in its properties; it becomes granular and white, but it also retains a degree of malleability; tempering does not harden is; it is not steel.

The next enquiry is, what will result from submitting iron to the double influence of nitrogenization and carbonization; will the result be a nitro-carbide, or a carbo-nitride of iron, a compound of iron, nitrogen and carbon? This third question M. Frêmy resolves without difficulty: he has nitrogenized iron by ammonia, and carbonized it by coal-gas. Thus by the employment of ammonia and coal-gas he had two means of great certainty of regulation, which enabled him to study the successive and simultaneous action of carbon and nitrogen upon iron. This enabled him to undertake a new series of experiments: and he clearly ascertained: 1st. That the action of lighting-gas alone converted iron into cast-iron. 2nd. That the carbonizing action of coal-gas upon iron, previously nitrogenized, gave to the compound the characteristics of steel. 3rd. That the extent or intensity of the acieration depends upon the quantity of nitrogen which has been given primarily to the iron; that an insufficient nitrogenization, no matter how far the carbonization be afterwards carried, gives only an imperfect steel, which leaves much to desire: on the contrary, after a sufficient nitrogenization carbonization produces a steel of very fine grain: that by submitting the red-hot iron to a mixture of ammonia and coal-gas, an acieration is immediately effected varying with the relative proportions of the two gases.

Hints to Colourists.

HARMONIOUS FLESH COLOURING—In colouring flesh our photographic painter too frequently follows a conventional idea, gleaned from some one specimen of his favourite master. One colourist will keep all his flesh greys greenish; another of a violaceous tone; and a third will invariably render them blue: and these followers of the conventional carry out such ideas irrespective of complexions or local peculiarities of surface. Now as the colourist who is ambitious of giving value to his production as a work of art should give especial study to the greys of his flesh colouring, let him throw aside any favourite theory or conventional maxims he may affect, and, placing a model before him, study from nature the varieties of these greys, their local peculiarities; and the modifying influences of light and shade. He will then find that such, although various in character and differing in their tones, are all in harmonious relationship with the local colours of the flesh; for instance, if the complexion be yellowish, the more delicate greys; such as result from the blue veins beneath the skin, will be very decidedly greenish, the more neutral greys which arise from the retiring character of the surface, will also be slightly broken with the yellow of the complexion, and that cool grey which is given by the glossy down of the skin will still be in harmony with the general effect, because it is not peculiar to any part but to the whole of the flesh, although its effect of course becomes more perceptible on surfaces retiring from the light. Of course, this paragraph will be of little value to those who merely *tint* their flesh, in which case the grey tones of the photograph itself may be allowed to represent all the greys, save such as result from the presence of veins.

PREPARING PHOTOGRAPHS FOR CRAYONS.—A very good way of preparing such is to make a mixture of isinglass and cuttle-fish powder, boiling, and well mixing before applying with a flat camel-hair tool. Possibly gum-tragacanth might serve the purpose even better than isinglass. This preparation gives that tooth to the surface, without which it is impossible to apply any body of crayon. Some correspondents, who have made inquiries about photographic colouring in crayons, will find this subject fully treated in a work soon to be published on artistic colouring in all its branches by our esteemed contributor Mr. A. H. Wall.

PAINTING HAIR.—The hard, unnatural, and ugly effect so commonly observed in the colouring of hair in photographic portraits arises from the absence of thought. Study your model and think about what you see, and such defects would soon be as offensive to you as to the educated artist. Observe, where the hair is parted, how softly and imperceptibly the flesh and the hair melt one into another. Note how—in common with all polished bodies—in or near the high lights there is a cool, or decidedly cold tone, according to the nature of the local colour. And observe how, where the hair meets the luminous colours of the flesh, it does not cut hard and keen of edge against the latter, but first melts imperceptibly into the shadow it casts upon the surface beneath it. Then notice how this "cast shadow" grows lighter as it, in its turn, melts into the grey edge peculiar to all shadows on flesh—and so unites beautifully and harmoniously even the darkest parts of the blackets hair to the lightest passage of the most delicate flesh.

Talk in the Studio.

Singular Cause of Fire.—Mr. Negretti recently wrote to the *Times*, and described the curious origin of a fire occurring in the window of his shop, where philosophical instruments were kept. A large lens was suspended in the window, which, acting as a burning-glass, concentrated the sun's rays on to the wood-work, which just happened to be in the focus of the lens, and set it on fire.

The late Duchess of Kent.—A photograph of her Grace the late Duchess of Kent is just in course of publication by M. Claudet, which will be the more highly valued from the fact that she rarely sat for a portrait to any photographic artist.

The Royal Portraits.—We understand that Mr. Mayall has now just completed an entire series of card photographs of the Royal Family. It is unfortunate that, owing to her failing health, the portrait of the late Duchess will not be included, as she was unable to keep an appointment made with Mr. Mayall for the purpose of a sitting.

New American Lens.—Transatlantic photographers are on the *qui vive* about a new lens, invented by, C. C. Harrison the eminent American optician, for producing pictures with a very wide angle of view on flat plates. The description published in the report of the American Society's meeting is not very intelligible; but a committee was appointed to examine, and report on the capabilities of the lens. *Nous verrons.*

Balloon Photography.—At a recent meeting of the American Photographic Society, some new prints were exhibited from a negative taken during a balloon voyage, by Mr. Black of Boston. Our readers will remember that we described some former experiments of Mr. Black, in this direction, undertaken some months ago.

The Ectograph.—Mr. Sutton recently showed us a very pretty positive photograph sent to him by one of his American correspondents. It bears the unexplained name of the Ectograph. Mr. Sutton was not at liberty to publish any details of the method of production; but we are engaged on some experiments for obtaining a similar class of pictures, which we will shortly publish in detail.

Tuition in Colouring.—It may be interesting to many of our readers who are anxious to add the charm of colour to their monochromous productions, to know that our esteemed contributor, Mr. A. H. Wall, has just opened a class for tuition in colouring photographs at 28, Old Bond Street.

Gallo-citrate of Iron Developing in Cold Weather.—A correspondent sends us the following:—During the recent intensely cold weather, I did not find the pyrogallic developer act with sufficient energy, so by way of experiment, I put into it a little protosulphate of iron, about 2 grains to the ounce, which made it all that could be desired for clearness and intensity. As I have not seen such a receipt, I thought it might be worth the attention of some of your readers.

Iron	1 or 2 grains
Pyro	1 „
Citric acid	1 „
Water	1 ounce.

The combination has often been used. Mr. Tunny, at a recent meeting of the Photographic Society of Scotland, gave a formula in which iron and pyrogallic acid are combined, and which he terms gallo-citrate of iron. He regards it as one of the best developers extant. The formula is as follows:—Fifteen grains sulphate of iron, having been dissolved in one ounce of water, is added to another ounce of water containing two grains of pyrogallic acid in solution. A copious precipitate of gallate of iron is formed, which is re-dissolved by adding *quant. suff.* of a saturated solution of citric acid in water. Those who try this will find that for a short time no apparent development takes place; but they will be agreeably surprised by the picture subsequently starting into existence in a most instantaneous manner. When this takes place the development is *completed*, no further length of time seeming to add to its density.

To Correspondents.

R. Gordon.—The yellow spot in your albumenized paper appears to originate in some defect in the texture of the paper. It may, however, have arisen from contact with some solution, possibly hypo, forming the insoluble hyposulphite of silver.

C. F. B.—We will insert your name. There are two especial defects in your picture, which will be easily remedied in future. The views have not been taken so that the images fall exactly in the same place on the ground glass. A tree which in one picture occupies a place on the right, in another occupies the centre of the picture. In such case the images cannot superpose to form a proper stereoscopic image. The other defect is the existence of some yellow spots from imperfect fixation. We are not in the habit of filtering collodion, and never, when we have tried, have obtained any advantage by doing so. We always allow it to clear by subsidence. There is, we believe, an instrument in existence called a "collodion filter," intended especially for this purpose.

J. C. H.—We cannot mention the name of any especial maker in this column, but will write to you.

Clipson Wray.—There are several French photographic journals, *La Lumiere, Cosmos, Revue, Bulletin, Moniteur*, &c. You should determine in which of them you wish to advertise, and then send through an advertisement agent in London.

No. 35.—The best plan to keep the dust out of your portfolio is to connect the flaps at the corners by means of gussets. We shall probably give a description of Harvey's portfolio shortly.

Wm. Lydamore.—The brown precipitate of oxide of silver formed by adding caustic potash to a solution of nitrate of silver, is to be well washed before adding to the bath. Caustic potash is sold in the fused sticks you describe. The streaks of which you speak, running in the direction of the dip, indicate the want of a little more acid in your bath. We shall be very glad to see the sketch and description of the camera stand to which you refer. We have not time to write private letters on subjects which can with propriety be answered in this column.

M. M.—Iron is not suitable as a developer in the dry processes generally; and it is especially unsuited to the development of tannin plates, as it at once turns black from the formation of tannate of iron, which is something like common writing ink. Pyrogallic acid solution, prepared as given in another page should be used. The use of gelatine prior to coating the plate with collodion, is to prevent the film leaving the plate. See Major Russell's article in the present number.

James L.—Common lacquer or spirit varnish and lampblack applied *cold* should be used for the dead black of brass work. If the brass be heated the varnish will dry bright. The authority to which you refer is in error.

J. C. L.—We have never found any bad results from adding a few drops of ammonia to the water in which soluble cotton is being rinsed after thorough washing. It should be however, rinsed a few times more in clean water. We never use less alcohol than ether in the solvents: frequently more. We do not recommend cadmium only as an iodizer, the physical properties it confers are not desirable. Half iodide of cadmium and half of one of the alkaline iodides give good results.

G. W.—Rive paper will give you, *ceteris paribus*, vigorous prints, and Saxe paper soft prints. But much will depend on the negative, the strength of the silver bath, &c.

D. G. Morgan.—To gain the full value of iron as a developer, the collodion should contain a bromide, and very few of the negative collodions sold do contain a bromide. You can use a positive collodion for negatives, but you may probably have difficulty in obtaining quite sufficient density; in that case mix a portion of negative collodion with the positive: most positive collodions do contain a bromide. You can add a bromide to any collodion by dissolving in alcohol and then adding a small portion of the solution to the collodion. Bromide of cadmium would be the best in this case, as being most soluble.

Justitia.—For producing the best transparencies where superposition printing is used, the negative should not be too dense; but somewhat thin and full of detail. Something will, however, depend on the preparation of the sensitive plate for printing on, and on the development.

B. N.—Your picture is spoiled by applying black varnish on the collodion film. We do not approve of black varnshing that side of the positive at all; but, if it be done, the film should always be varnished with a spirit varnish first, so as to prevent the black varnish permeating the collodion film. If you want the picture to be non-inverted, there are other ways of managing it. Perhaps the simplest is to take the picture *through* the glass. Remove the spring from the back shutter of your dark-slide, and place the plate in with the excited film next the back, keeping it firmly in its place by a piece of vulcanized india-rubber at the corners. It will be important to wipe the back of the glass, so that it may have no drops standing on it to refract the light.

W. H. B.—If you will send us your address we will advise you privately, as we can do so more fully than in this column. Of the names you mention No. 1 is best.

Q in the Corner.—The exact strength of the tannin solution is unimportant. See article by Major Russell on the subject in the present number.

W. H. H., in our next.

Stereoscopic Exchange Club.—S. Clifford, Australian House, Hobart Town, desires us to thank those gentlemen who have exchanged with him, and to request them to address Tasmania, instead of Australia, as the former is the correct designation, and the latter might lead to some inconvenience.

E. Morton.—We have no doubt at all of the advantages, theoretical and practical, of the solar camera, and have seen some very fine pictures produced by it. It is quite possible, however, to produce good enlargements without its use. We shall have something to say on the subject shortly.

E. W.—We do not recommend the proto-nitrate of iron for negative development. It gives a silvery white metallic picture, which is a good characteristic in a positive, but is not desirable in a negative. The acetate of iron is a good negative developer.

Photography on Wood.—Mr. Bennett Lowe, whose communication on this subject we published last week, desires us to state that the allusion made in a recent article on this subject, to Mr. Langton having experimented in this direction for some years previous to 1854, was an error

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INTENSIFYING PROCESSES.

An interesting paper on this subject, which was read by Mr. Blanchard at the last meeting of the South London Photographic Society, will be found in another page. There can scarcely be any need to urge the importance of securing, where it is at all possible, a perfect negative at one operation, without the aid of subsequent processes for producing sufficient printing intensity. Where the desired result can be obtained at once, without a secondary process involving trouble and risk, there is no danger, we apprehend, of the photographer resorting to intensifying processes in his regular practice. It is only where there is something to gain by producing the negative at two operations, not otherwise obtainable, that such processes become legitimate and desirable. It so happens, however, that there are several very marked advantages which render these processes desirable and important much more commonly than might at first sight appear. These advantages consist of the facility with which softness, half-tone, and delicacy may be secured in the negative, combined with very short exposure.

The first-mentioned of these qualities as resulting from the operation of intensifying will, at the first glance, startle some of our readers, as they have doubtless been in the habit of associating the idea of hardness with all intensifying processes, and, without a question, that is one of their commonest tendencies when misused. When applied under proper conditions, however, hardness is by no means a legitimate consequence of their use, as we shall show.

One of the simplest methods of intensifying, and one becoming of almost universal application amongst first-class portraitists, is that in which the intensifying is effected before fixing. The negative is developed with iron, and when all the detail is fully brought out the plate is well washed. When viewed by transmitted light at this stage a very perfectly developed negative should be seen, but without anything like sufficient intensity for printing purposes. This has now to be communicated by the use of an organic developer. A two- or three-grain pyrogallic acid solution, with its due proportion of acetic or citric acid, and a few drops of silver solution, is now applied, and the image rapidly begins to blacken and gain intensity, the intensifying by this process being continued until the requisite density is obtained.

There are two or three precautions necessary to be observed in using this method. After washing the plate well from the iron solution, it is desirable to cover it with the pyrogallic solution, and make it run freely without greasy lines, *before adding the silver solution*, otherwise there is danger of staining the plate. The silver solution should be pure, *not from the bath*, but prepared for the purpose, about twenty grains to the ounce is strong enough. If it be used from the bath there is danger of irregular reduction. In hot weather there is danger of a foggy deposit on the shadows taking place during the intensifying. Should this occur the plate should be washed at once, and a judicious application of cyanide will generally remove the nascent foggy deposit. There are two methods, however, of preventing its formation, the first the free use of citric acid in the pyrogallic acid solution; and a second method, perhaps less known, but still more efficacious, is the application of a solution of iodine to the film after washing away the iron developer, exposing the plate for a few seconds to light, again washing, and then applying the intensifying solution of pyrogallic acid and silver. This method prevents the formation of the deposit on the shadows and allows also of considerable intensity being more easily attained.

The chief advantage of this process arises out of the fact that it permits a bromide to be used in the collodion, and thus secures all the advantages which the presence of a bromide can confer,—extreme sensitiveness, softness, and cleanliness. With a simply iodized collodion the advantages of an iron developer are not very marked; and with a pyrogallic acid developer, the advantages of a bromide are not always very striking. But with a bromized collodion a much softer picture is obtained by means of iron development, in about one-third or one-half the exposure that would be required for a simply iodized collodion with a pyrogallic acid developer. We are fully aware that it is possible to have a simply iodized collodion in such a fine condition that the most perfect negative possible may be produced by pyrogallic acid development; and with also, the shortest possible exposure. But we also know, that these are conditions very difficult of attainment, certainly not always attainable at will, and when secured, the collodion cannot be kept in that condition. If it be so one day, it loses sensitiveness by the next, and goes on deteriorating daily. Another difficulty also exists with the simply iodized collodion, it is the fact that when it is in the finest possible condition as regards sensitiveness and half-tone, it is also in its most sensitive condition to the influence of all damaging agencies, and it is almost impossible to produce a clean picture; fog, comets, stars, and all kinds of unsought meteorological and astronomical phenomena abound on the plate. It is a certain fact within our personal and editorial experience, that there is more complaint as to the rapid loss of sensitiveness, and the prevalence of all kinds of spots in the simply iodized collodions of two of the most celebrated makers, than exists in any other case. The presence of a bromide changes all this. The highest state of sensitiveness, the power of yielding perfect half-tone, and the facility for obtaining perfectly clean pictures, remain uniform and undeteriorated for months.

The qualities we have just described remind us of one of the primary advantages to be derived from the use of intensifying processes, and the one to which Mr. Blanchard chiefly addressed himself the other evening,—their value as adjuncts to instantaneous photography. This word instantaneous, is a somewhat indefinite one as used in photography. There can be no doubt but that in its absolute sense it would refer to an indivisible point of time; but it is applied in photography to any rapid exposure in which there is no intentional prolongation. An exposure as rapidly effected as the lens can be uncovered and covered, no matter what mechanical appliances be used for the purpose, is generally called instantaneous; although there can be no doubt but there is an immense disproportion between the time of exposure effected by such contrivances as that of Mr. Warren De la Rue for photographing the sun, or by Mr. Skaife for photographing a rocket in its flight, and that effected by taking off and putting on the cap of the lens by the hand's most rapid movement. Still, for the least rapid of these, in order to obtain a good negative, it will be generally desirable to develop with iron and intensify afterwards.

The pictures of Mr. Wilson of Aberdeen, which certainly rank amongst the finest instantaneous pictures with which we are acquainted, are developed with iron, and subsequently intensified, and if we are informed rightly by a method not commonly used. As wé have not seen this published, and are not, we believe, violating any confidence, we may briefly state his method. The exposed plate is developed with a tolerably strong solution of iron, until all the details are fully out, and as much intensity is obtained as that application of the iron will produce. It is then washed, but not fixed, and placed in a box. It will remain in this condition without entire dessication for some time, and allow other views of the rapidly declining sun—we are referring especially to the sunsets—to be secured, before it was quite sunk beneath the surface of the water. The whole of the plates are then intensified at leisure. To do this, a small quantity of silver solution, either from the bath or otherwise, —a fresh ten or twenty grain solution would be best—is poured a few times on and off the plate until it flows freely and evenly; this is then followed by a second application of the iron developing solution, to reduce the silver and produce the requisite intensity. As will be seen, this process is similar in character to that which we have just described as largely practised by professional portraitists, the difference being, that in the intensification of the latter, an organic developer is used, and in Mr. Wilson's method the reduction is more entirely inorganic.

It will be observed that all the methods given by Mr. Blanchard are used after the picture is fixed, whilst those to which we have referred are applied to tho film before the film of iodide of silver has been removed by cyanide or hyposulphite of soda, and bear more analogy, therefore, to development proper. When the intensifying is effected at this stage of the operation there is no danger whatever of producing hardness, if the plate have received anything like proper exposure; as the half tones and faint shadows receive their fair share of the subsequent reduction as well as the higher lights. In all cases, however, where the intensifying is effected after fixation there is a tendency to greater reduction on the high lights than on the half tones, and hardness is often the result. It is important, therefore, that in all cases where intensifying after fixing be practised a fully exposed picture, full of half tone, be obtained as a basis of operations.

The process most allied to ordinary development of those mentioned by Mr. Blanchard is the one given last in his paper, and the one to which he gave the preference. It is, unquestionably the easiest to manage. and the one most under control as regards the character of its results. The process was first recommended by Messrs. Barreswil and Davanno in their *Chimie Photographique* in the year 1854. They there recommend a satuiated solution of iodino in water to be applied to the film, which was then to be exposed to the light, and afterwards treated with a solution of gallic acid and silver. Iodine is, however, very sparingly soluble in water, but freely in solutions of the alkaline iodides; and they subsequently recommend a solution of one grain of iodine and two grains of iodide of potassium in an ounce of water, to be applied to the plate in a similar manner, following with a solution of pyrogallic acid and silver. Mr. Blanchard recommends the employment of a strong or a weak solution of iodine, just according to the amount of intensifying required. There is one circumstance in connection with this formula we may mention, having ourselves used it largely and successfully; there is no necessity to expose the film of iodide of silver to the light, as the process may be effected in a dark room without any such exposure.

There is one important precaution which applies to this and all intensifying processes—the imperative necessity of washing thoroughly between the application of each distinct solution—otherwise stains will inevitably occur. There is another hint we may give here as applying to all processes in which intensity is produced by the reduction of silver; it is the fact that if the silver be rapidly reduced there is a tendency to a greater precipitation on the high lights than on the half tones, whilst if it be slowly and steadily reduced, the deposit is harmoniously distributed over the whole.

The processes in which the bichloride of mercury is used as an intensifying agent, are more difficult to manage, and, except in judicious hands, do not always give good results. Complaints are made of the film becoming rotten and leaving the glass; and the negatives obtained are often very hard and unsatisfactory. Nevertheless, some of the finest pictures we have seen were produced from negatives intensified with iodide of mercury. This was one of the first intensifying processes proposed, being suggested in 1853 or 1854 by Mr. Maxwell Lyte; the use of bichloride of mercury had already been proposed by Mr. Archer, aud various blackening processes were proposed about the same period. Professor Donny proposed a method which assisted to keep the film on the plate; having bleached and thickened the deposit by means of bichloride of mercury, instead of, after washing, applying some other solution which might have a further tendency to destroy the film whilst it darkened the deposit, he applied a solution of gum arabic, and, whilst the film was still moist, submitted it to the action of a current of sulphuretted hydrogen gas, by which means he obtained at once an intense, black negative. Few persons will, however, we apprehend, avail themselves of this troublesome and offensive aid.

Where the use of mercury as an intensifier is resorted to, its peculiar dangers must be met by the use of judicious treatment, and the employment of a proper collodion. Hardness must be avoided by the use of a sufficiently bromized collodion, giving abundance of detail in the original deposit, and the tendency of the film to break, by employing a collodion which adheres well to the plate. Allowing the plate to dry will also materially aid this, and will give the additional advantage of greater delicacy and sharpness than can by possibility be obtained by an increased deposit whilst the plate is in a wet, absorbent, and spongy condition. We have some experiments in progress for meeting the difficulty presented by the film leaving the plate, which, if successful we shall shortly lay before our readers.

A variety of other intensifying agents have been proposed, the majority or all of which we have tried. Amongst these, we name chloride of gold, chloride of platinum, hydrosulphate of ammonia, &c. The chief action of these and some others, is to change or darken the colour of the image by reflected light, but havo little power in repelling the influence of actinic rays by transmission, and we do not recommend their adoption in any case, except where the slightest possible increase of intensity is desirable. As they appear in all cases to blacken the film very much, they are very deceptive.

THE TANNIN PROCESS.

We call the attention of our readers to some further hints on this process, given in a letter by Major Russell, in another column. We may suggest also that we have heard, within the last day or two, of a very efficient method practised by a skilful amateur of meeting the chief difficulty—the tendency of the film to leave the plate. He adds to the tannin solution a little gum-arabic, and also a portion of citric acid. This, we understand, gives some additional good qualities to the negative, and prevents the film leaving the plate in the developing, fixing, or washing. We hope in another number to be able to state the proportions: in the meantime, we commend the method to the attention of of our experimental readers.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

Next in importance to iodine and the iodides stand bromine and the bromides. These being prepared from bromine, we will describe that element first.

Bromine occurs mostly in sea water, and certain mineral springs, although it has been met with in Mexico and some parts of Brittany in combination with silver. It is prepared generally from sea water; the mother-liquor of the water, which has been evaporated for the purpose of separating the different salts, has chlorine gas passed through it as long as the yellow colour increases in depth. The chlorine decomposes the metallic bromide into chloride and free bromine, the latter producing the colour. An excess of chlorine must be avoided, as that would produce chloride of bromine and thereby decolourise the liquid. Ether is then added, and the mixture well shaken together. On standing, the ether rises to the top of the solution, coloured hyacinth red by the bromine which it has absorbed. It is then to be decanted and shaken with solution of caustic potash, which converts the bromine into bromide and bromate of potassium. The solution is evaporated to dryness, ignited and distilled with peroxide of manganese and sulphuric acid, when bromine passes over; it must be collected in water.

The bromine so prepared contains water, and generally a small quantity of chlorine. From the latter it is separated by washing with a large quantity of water, and it may then be dried by distillation over chloride of calcium.

Pure bromine is a very dense mobile liquid, three times as heavy as an equal bulk of water. It is of a deep brownish red, nearly black colour. It freezes at 20° C. forming a yellowish brown crystalline mass, and boils at 45° C., being converted into a yellowish red vapour. It has an extremely powerful and offensive odour, resembling chlorine, but worse. Hence its name from the Greek βρῶμος, an offensive odour. Its vapour when inhaled is less injurious than that of chlorine, and if very dilute may be breathed with perfect impunity; large quantities, however, give rise to cough, giddiness, bleeding at the nose, headache, &c., and if still more concentrated would prove fatal. It has a sharp, burning taste, and is very poisonous in the liquid state, one drop proving instantly fatal to a bird. Bromine in small quantities stains the skin of a yellow or brown colour, which if strong can only be removed with the skin itself. Applied to the skin in larger quantities it corrodes it and produces violent inflammation. It corrodes wood, cork, and other organic substances, and acts upon vegetable colours in a similar manner to chlorine. The reaction between bromine and starch is not so delicate as that between iodine and starch, although the latter substance is frequently used in the laboratory, as a convenient test for this element. When a solution containing free bromine is mixed with a little starch paste, the latter becomes of a strong orange yellow colour. It dissolves in 33 parts of water, forming a yellowish-red solution, smelling like bromine.

This solution, which is frequently employed in the Daguerreotype process, is made simply by shaking up an excess of bromine with distilled water. The surplus bromine sinks to the bottom, and the supernatant liquid will be the desired solution. It loses bromine when exposed to the air, and when kept for any length of time becomes acid. Bromine is soluble in alcohol to a greater extent than in water, and still more so in ether. In its other properties it greatly resembles iodine and chlorine, standing midway between the two in its affinities and chemical characteristics.

The most important compounds of bromine are the bromides of potassium, ammonium, cadmium, and silver.

Bromide of Potassium is prepared in several ways—the best plan is to decompose bromide of iron by means of carbonate of potash. Pure iron filings are to be placed in a flask under water, and bromine added to the liquid drop by drop, waiting till the action has ceased with one quantity before more bromine is added. The iron will gradually be dissolved, forming a pale green solution. (The addition of bromine must not be continued long enough to dissolve all the iron; some of the metal must be left at the bottom of the flask). When sufficient bromine has been added, the solution must be filtered and preserved in a well-stoppered bottle for use. A knowledge of the combining proportions of bromine and iron will at once tell how much of each to take in order to prepare a given quantity of bromide of iron. The equivalent, or combining proportion of bromine, is 80, and of iron is 28, the two bodies must therefore be mixed together in these proportions (or rather there should be a trifling excess of iron) in order to produce 108 parts of bromide of iron; and this 108 parts of bromide of iron, when completely decomposed by carbonate of potash, will yield 119 parts of bromide of potassium, the equivalent of potassium being 39. The decomposition of the iron salt is effected as follows:—An equivalent quantity of carbonate of potash, as pure as possible, is to be dissolved in distilled water, and the solution of iodide of iron being raised to the boiling point in a flask over a sand bath or spirit lamp, the carbonate of potash solution is to be gradually poured into the iron salt, and when the oxide of iron is completely precipitated, the liquid must be rapidly filtered. Now place the clear solution in a clean evaporating dish, and gently evaporate it nearly to dryness. When it is sufficiently concentrated for a drop, taken out by means of a glass rod and placed on a cold glass plate to crystallize on cooling, remove the dish from the fire, and place it aside in a cool place to crystallize, covering it over with a sheet of blotting-paper to keep out the dust. In a few hours the bottom of the dish will be seen to be covered with a mass of crystals, which must be removed and drained in a funnel. These crystals may be completely purified by dissolving them in water and then evaporating the liquid to the crystallizing point again. If the solution, before evaporating it this second time, has an alkaline re-action to test paper, this must be removed by the addition of a little hydrobromic acid.

Bromide of potassium forms brilliant cubical crystals, resembling the corresponding iodine salt. It fuses without decomposition when heated, and has a sharp taste. It dissolves in water, readily producing great diminution of temperature, and is much more soluble in hot than in cold water. It is only slightly soluble in alcohol. 100 parts of bromide of potassium yield 160 parts of bromide of silver when entirely decomposed.

The impurities in the commercial salt are likely to be of the character we have already mentioned as occurring in iodide of potassium. The methods of purification given under that head will, therefore, be quite applicable for the purification of bromide of potassium.

Bromide of Ammonium.—If, in the process above given for the preparation of bromide of potassium from bromide of iron, carbonate of ammonia had been used instead of carbonate of potash, the result would have been the ammonium salt. Bromide of ammonium greatly resembles the corresponding iodide, and may be purified in a similar manner. It is a colourless salt crystallizing in long crystals, having a sharp saline taste. When heated they evaporate without fusion. Exposed to the air the crystals become slightly yellow, and have then an acid reaction, owing to the formation of a small quantity of hydrobromite of ammonia. Bromide of ammonium is very soluble in water, and also more soluble in alcohol and ether than the potassium salt.

Bromide of Cadmium may be readily prepared by placing 80 parts by weight of bromine under water, and gradually adding thereto 60 parts of metallic cadmium in fine filings, shaking the whole together. As soon as the combination has ceased, and all the bromine has disappeared, filter the solution from the few grains of cadmium which will remain undissolved, and evaporate it down over a water bath until a crystalline scum forms on the surface, then allow the solution to cool and crystallize. Bromide of cadmium thus formed will be pure, provided pure materials were used in its preparation. It forms white efflorescent crystals easily soluble in water, alcohol, and ether. The crystals of this salt differ from those of the iodide of cadmium, in that they contain four atoms of water, the iodide being anhydrous. This peculiarity must be borne in mind when calculations are being made in which the amount of iodine or bromine in the cadium salts form elements in the enquiry.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Balance.—That every portion of a picture should exist, not in independent scraps, like so much patchwork, but in harmonious relationship, as parts of a *whole*, is acknowledged in every branch of art. For this reason the equilibrium of forms, lights, shades, colours, &c., are studiously sought, so that the interest or attention of a spectator is not shut up in a corner, but carried by skilful composition over the whole surface, each part being properly balanced, although displaying a sufficient amount of variety and subserviency of position, proportion, &c., to carry out the artist's primary design. This proper arrangement of parts being a matter of great importance, the artistic photographer in arranging accessories, grouping figures, or selecting his point of view, always aims at securing a well-balanced composition. If he finds the general mass of light or dark crowded into one corner of his focussing-glass, he shifts his position to bring in sufficient light or dark to balance the same; should all the interest be confined to one point, he moves again to take in some object possessing that degree of interest which will be subservient to the general design, and at the same time restore the lost equilibrium, and so on. It must be evident that in endeavouring to secure the quality now under notice, a lens which commands a wide angle of view is pre-eminently desirable. Conscious of this, when Mr. Sutton's "panoramic" lens made its first appearance, I hailed its advent with no small pleasure, and, although I have not myself had the opportunity of practically testing this apparatus, I do believe that it will fulfil our expectations, and give us far more power over the pictorial resources of art than we have hitherto possessed. It is now, I believe, in in the hands of one of our most skilful opticians, and will receive that fair and perfect test which I fear it has not yet had, and which may, I hope, be crowned with the most thorough success. If we can secure a good lens, giving us so much subject that we may choose exactly what portions we shall retain, and what remove, the balance of parts will be more easily grasped, and other artistic advantages secured which in this place I have no right to enumerate, although in the course of these articles the reader will duly recognise them.* With his present appliances the photographer should first consider the form his intended picture will take. This determined, he should calculate what objects it will include, what amount of interest they have, and how they will be related as light or shade in his completed production; and this done, let him then consider how the various parts will *balance*, never, however, losing sight of the more important design embodied in the expression of the sentiment, character, or story of the whole. The operator who has been quite unaccustomed to this bit of mental exertion will think it a great bore, and feel a very strong inclination to make excuses to his conscience for declining the effort, but if he persevere, the mind will by-and-by perform its part of the work almost as instinctively as the hand, while his productions, by displaying more evidence of intellectual culture and thought will win greater esteem and respect both for himself and his art. Bear in mind, as Ruskin says, that "it is the essence of composition that everything should be in a determined place, perform an intended part, *and act in that part advantageously for everything that is connected with it.*" In thus re-producing in symmetrical order the various parts, one great danger must be avoided, viz., *formality*, it is not necessary that one part be balanced by another which resembles it, or that the parts be arranged after the fashion of the "three jolly butcher boys, all of a row;" nor, in short, that *variety*, the essence of the picturesque, be at all lost sight of.

* Since writing the above a very fine set of glasses, securing an angle of 70°, has been shown me. It was manufactured by Dallmeyer, and covered splendidly.

Base-line.—A term for the line represented by the bottom of the picture. The geometrical plane. (See *Perspective.*)

Beauty.—Although this subject has been so learnedly discussed by our great metaphysicians, that none but the bold venture upon its investigation, a few passing remarks will scarcely be out of place here. The term has received the most extensive application, and originated no little controversy; and as to the quality of abstract beauty I have now within my reach a dozen good or eminent authorities, who in treating the subject contradict each other, and themselves more or less, at almost every step of their progress, and leave us, hapless readers, at their last pages in greater darkness, and far more perplexed than we were before. The term beauty includes all that is pleasing or agreeable to the senses; some trace its origin to the imagination; others to associations; others to moral superiority; some to the conventional only, and others to mere physical conditions. Sir Joshua Reynolds asserted that it was never to be found in extremes; Lord Jeffrey, without much fear of contradiction, that it was the "reverse of ugliness;" Haydon thought it had its origin mentally, physically, and morally "*altogether* in woman." The fact is, I expect, that we must be content to recognise many varieties of beauty, without expecting to trace them all to any one source. Close ties unite even the most opposite kinds of beauty, and with each many are associated. Like a painting, in which all the opposites of lights and darks, forms and colours, are united into one harmonious whole, each kind of beauty is made up of many and various elements. We hear, for instance, the liquid sweetness of whispered music breathing through some soft-voiced instrument, and straight there comes stealing, unconsciously perhaps, into our dreaming memory the ripple of a little stream tripping with glancing feet over the murmuring pebbles, strewing its way in the peaceful quietude of a solitary; and there blends with this the low sweet sigh which floated away with our earliest words of love; and there comes too the memory of exquisitely delicate perfumes, allied *somehow* with such faint low sounds, and such tender gentle emotions; and then, faint with extreme delicacy, come whisperings of the pure and lovely prismatic colours, just tinging some pearly cloud; and thus these images of beauty, all different, all alike, become so mingled together that the languid thoughts refuse to separate them, and we only recognise their presence by the holy sweetness which steals into our hearts, filling them with indefinite emotions of tenderness and love, until full of instinctive gratitude we turn to the Great Creator of a universe so full of loveliness and beauty, thanking him with passionate earnestness for the glorious privilege of human life. Such is the power of beauty, which, translated into a more tangible form speaks to both heart and mind in the language of art, the language I would fain urge photographers to learn and to speak.

Greek art gave us an ideal beauty, a beauty which you thought about before you felt it well, which only reached the heart through the head; but our more modern masters go direct to the heart: beauty of form, mere physical beauty, bounded the Grecian's ambition; we have learnt to love the poetry of spiritual truth, to reproduce that beauty of nature with which is associated all beauty of every kind. There is no beauty in falsehood; Satan, the type of ugliness, is also said to be "the father of lies." It is not the *truthfulness* of photography which tends to mar the beauty of its productions, far, far from it. Nature is prodigal of beauty, and we have but to acquire or cultivate the discernment which we call *taste*, and that power which we call *art*—recognising beauty in whatever guise it may appear—we may mirror faithfully not only nature's outward form, but its very soul, seizing the modest expression of the wee shy wild flowers in their little grassy nest, and the grandeur and might expresed in the boundless ocean, or the sublimity of sky-piercing mountains. The *parrot* photographer, who thinks his sole virtue that of imitation, may mock at the nobler aims of art, and laugh to scorn the ambition which strives to elevate his calling; but he is not, and never will be, even in the most degraded sense of that much-abused term, an artist. The *artist* photographer will cultivate his taste for beauty, and seek inspiration from its presence wherever it may be found; and as Charles Swain tells us—

> "The presence of the Beautiful
> Takes inward shape of every kind!
> As *Music*—which leaves language dull—
> Is *Painting* to the Blind!"

With which, by way of hint, I will quit the subject, important and interesting though it be.

Bird's-eye View.—A view taken from an eminence, in which the horizontal line is very near the top of the picture. Such views are far from beautiful in a pictorial sense, although frequently adopted where it is desirable to combine some of the qualities of a map with those of the picture.

Bizarre.—A term used to describe that which is grotesque, capricious or extravagant.

Black.—Black being representative of the photographer's extreme dark, should, like white, which represents the other extreme, be jealously hoarded. Masses of black tend to decrease the vigour of the shades, just as I have shown that masses of white rob the high lights of force. Sparingly used black and white are the elements of brilliancy, boldness, and vigour; lavishly used, they destroy these qualities. In nature the range of tones and shades which exist between the dazzling brilliancy of white sunlight, and the intense blackness of a total deprivation of light, is indeed a vast one, and when we consider how few are the tones which separate the white of paper—the photograph's highest light—*seen as it usually is in a weak light*, from a black surface *reflecting light*, it must be at once apparent how extremely choice we should be with both our white and black, instead of seeking the intense pictures still too generally admired among photographers. Black is the complementary of white, that is to say, when placed in juxtaposition the white appears more brilliant, especially at the point of contact, than it really is, and the black darker. Acting upon this hint, we are enabled greatly to extend our scale in forcing the effect of the two extremes by contrast, bringing the focus of dark and the focus of light together, and graduating from the extremes thus obtained.

Boldness.—The opposite of insipidity or tameness (See *Vigour*).

Brilliancy.—Applied to the sparkling luminous effect secured by the judicious management of a picture's chiaroscuro &c.

THE CAMPHINE OR BENZINE WAXED-PAPER PROCESS.

By using camphine or benzine as the solvent for the wax, the impure portion is thrown down, and the pure part only retained in solution. This constitutes the chief element of success in this process, as it obviates the granulated appearance, which is the great drawback of the ordinary wax-paper. Camphine is greatly preferable to common turpentine for this purpose.

Paper prepared with benzine is said to require less exposure in the camera, and to yield more intense blacks in the negative. But whether prepared with benzine or camphine, the paper is very much more sensitive than ordinary wax-paper.

Papier Saxe is the best for this process. Hollingworth's thin is not so good, and has a water-mark, which shows through the negative, and prints on the positive. The paper must be cut to the size required, and the face or smoothest side marked with a cross at one corner with a black-lead pencil. It is important always to float the marked side first on the different solutions, and to have a guide for placing the paper right in the dark-slide or double-back prior to exposure.

Excellent benzine may be had of Bolton, Holborn Bars; and pure wax, in half-a-crown cakes, of Brecknell and Turner, Haymarket.

The formulæ (in a much-improved shape) and the various manipulations are as follow:—

Camphine or Benzine Waxing Solution.—Put 300 grains wax, scraped fine, and 20 fluid ounces benzine or camphine into a quart bottle, and stand it before a fire, shaking occasionally, until the wax is dissolved. Set aside to cool, then add by degrees 80 grains iodine, and agitate. (It is not advisable to employ excess of wax or iodine in this stage of the process.) Let the whole stand for a week, to allow any portion of the wax to precipitate; then filter through double paper, and the solution is fit for use. Pour sufficient of this liquid into a flat porcelain dish, scrupulously clean and dry; take one of the papers by the opposite corners, and lay the marked side on the solution, first letting the middle of the paper touch the liquid; then gradually drop the corner held by the right hand, and next that in the left hand, to avoid air bubbles. Should any form, raise up one corner of the paper with a pair of horn forceps till the bubble is arrived at, and then lower it again. When the paper is thoroughly saturated, immerse it, using a glass rod in the left hand, and a glass triangle in the right. Pass the triangle over the paper, and press it against the bottom of the dish, so as to remove air bubbles from the surface of the sheet. Proceed with half-a-dozen sheets in this way; more than this number should not be in the dish at the same time. After letting them remain in the liquid for five minutes, or thereabout, turn them all over together, so that the first put in will be uppermost. Take the horn forceps, and raise this sheet by one corner, holding it over the dish to drip till it has nearly ceased. Then thrust a large pin through the upper angle, and stick it into the edge of a deal shelf, so that the paper may be suspended with its lower corner resting on blotting paper. Of course, the place must be clean, and perfectly free from dust. When all the papers have been thus treated, proceed with six more; and when they have been hung up, take down the first six, and press them between clean blotting paper, and hang them up in another part of the room till quite dry.

The waxing liquid will serve till all used up, therefore return the residue into the bottle through a filter. The dish should be immediately washed out, and any adherent wax rubbed off with paper, if necessary. The same dish, if kept perfectly clean, will do for the subsequent operations of iodizing, sensitizing, and developing. Put the prepared papers away in a portfolio, till required for iodizing, previous to which warm them slightly before a fire.

The Iodizing Solution.—320 grains iodide, and 40 grains bromide of potassium, dissolved in 20 fluid ounces of whey. (This is at the rate of 18 grains to the ounce, a strength which should not be exceeded. The French operators, followed by Mr. Sisson, obtain first-rate results, with 10 grains of iodide and 2 of bromide to each ounce of whey, after short exposures. 12½ grains iodide and 2½ grains bromide would work well.) Filter, and after use, return into the stock bottle through filtering paper. Immerse the papers, sheet by sheet, in this bath, and let them remain in about twenty minutes in warm summer weather, half-an-hour in mild weather, and one hour in cold weather. Adhere to the rule of not having more than half-a-dozen sheets in the bath at the same time. Take each out separately, hold to drip, press between blotting paper, or between the leaves of a blotting book, to be kept specially for the purpose, and hang up till quite dry. They will keep for more than twelve months without deterioration, if not exposed to damp.

The Sensitizing Bath.—Dissolve 400 grains of nitrate of silver in 9 ounces water, and 4 grains iodide of potassium in one ounce water; add the latter to the former, stirring with a glass rod till the precipitate is dissolved. Then add 5 grains citric acid, dissolved in 3 drachms crystallizable acetic acid, and filter through double paper. This bath must not be exposed to day-light, and improves by keeping. After use, return it to the bottle through a filter. To sensiize the paper, float it on the solution, marked side downwards, till the dark colour disappears, then turn it over and float the other side till it has acquired a uniform primrose colour. Raise it with a pair of horn forceps, let it drip, and place it in a dish containing as much water as will cover it well; give the dish a rocking motion for half a minute, then if the paper is intended for exposure next day, blot it off in a separate blotting-book to be used for this purpose only, aud expose to dry. If wanted for longer keeping, give the papers a second washing in another water, blot off, and dry, and they will perhaps keep for a week in moderately warm weather. Sensitize the papers at night by the light of one candle. When quite dry, they may be placed in the double back or dark slide ready for exposure. If put in damp, they will crease. Extra papers should be kept in a portfolio aud subjected to pressure. The washing waters should be put into a bottle with a spoonful of salt to convert the nitrate they contain into chloride of silver, after which the water should be thrown away.

Exposure.—The time of exposure is pretty much the same as for a collodio-albumen plate, but is best ascertained by experiment. Do not expose in a bad light, and be sure not to under-expose. The papers will keep till the day after exposure, if pressed tightly between the leaves of a blotting-book. If the development can conveniently take place on the same evening, it is advisable uot to defer it, particularly if three or four days have elapsed since the sensitizing.

Developing Solution.—Put one drachm of gallic acid and twenty ounces of filtered rain or soft water iuto a clean bottle, expose before a fire, or stand it on a hob, shaking occasionally till the gallic acid is dissolved. Add six or eight pieces of camphor to keep it better, and to ensure clean lights in the negatives. Before use, carefully filter the requisite quantity, pour it into a dish, and add one drop of a 30-grain aceto-nitrate solution to each ounce. In order to develope the exposed papers, float them on this bath, face downwards, carefully avoiding air bubbles. Take one paper at a time, float it, and when the sheet lies quite flat on the surface, and the image begins to appear, raise it with the horn forceps at one corner, turn it over, and immerse it face upwards. Proceed in the same way with the others. Four quarter sheets may be developed together in ten ounces of solution. If there is any tendency in the papers to float on the surface, it is because they are not sufficiently saturated, and they must be kept under with the glass triangle, until they remain beneath. They may then be left until the whole of the details are perfectly developed, when, if the skies are not black enough, a few more drops of silver solution should be added to bring up the intensity. This addition of silver must be cautiously made, for if too much be used, the lights will acquire a dingy appearance. When the skies look intensely black, and the image is slightly over-developed, the negative must be well washed in two changes of water, and may then be fixed as usual. The intensity is afterwards much reduced in the hypo bath. Under-exposed pictures can be treated with a two-grain pyrogallic solution with two drops of aceto-nitrate to the ounce, and when the details are well out, can be returned to the gallic acid solution. Sometimes the paper acquires a dirty yellow colour in developing, but this is of no consequence; indeed, some of the best negatives are of this complexion.

The Fixing.—Dissolve one ounce of hyposulphite of soda in eight ounces of water, and immerse the negative in it. After a dozen papers have beeu cleared in this bath, it must be put aside, and another made. When the iodide of silver has been dissolved out, wash the negative in running water for three or four hours. Finally press between blotting paper, and dry in a warm place, or before a fire.

The fixing can be deferred indefinitely, so that the tourist need not trouble himself with that operation until he returns home.

The final Waxing.—This is easily performed. Each negative is laid in a dish of hot, melted wax, and immediately becomes saturated. It is then raised, allowed to drip, placed between two sheets of blotting-paper, and ironed with a moderately hot iron. The process is now complete.

Have a shallow tray made of block-tin, fitting into a tin vessel or reservoir to hold hot water, about one and a half or two inches deep, and having a spout with a hinged cover at one corner. The apparatus, made by a tin-worker, will cost seven or eight shillings. Set it quite level, pour boiling water into the reservoir about half an inch deep, and set a spirit-lamp underneath. Place a few lumps of wax in the tray, and when they become liquefied the negative is laid carefully upon it, aud is at once saturated, as before mentioned.

In working this process, the dishes and apparatus must be extremely cleau, and the manipulation carefully performed. With the formulæ here given, and a proper amount of exposure, the tourist may always make sure of obtaining a good negative, which (as M. Blot says) "will give pictures with pure whites, and blacks of perfect intensity, with a delicacy which rivals that of albumenized glass, without its hardness and excessively sharp lines."

The original formulæ of M. Tillard, add to the first or waxiug solution, two ounces of cold drawn castor oil, which is in many respects objectionable. The object of this addition is to prevent granulation in the negative, but should this result appear, it may be guarded against by steeping the papers for 10 or 15 minutes in a preparatory bath, made by boiling 30 grains of Irish moss or carrageen, in a pint of water for five minutes, and filtering. With a few bits of camphor in it, this preparation will keep indefinitely, and may be used to the last drop. When dry, the papers may be placed in the benzine or camphine waxing solution. But in most instances, this precaution will be found unnecessary.

R. A. R.

INTENSIFYING PROCESSES CONSIDERED AS ADJUNCTS TO INSTANTANEOUS PHOTOGRAPHY.

BY VALENTINE BLANCHARD.*

All who have beheld the glorious productions of Wilson, of Aberdeen, and the instantaneous sea and sky photographs of Le Grey, must be impressed by the conviction that the future of artistic photography lies not in giving forth to the expectant world delicate primrose or white skies, with the hills so sharp in outline that the thought of the consequences attendant upon a fall upon them makes us quite uncomfortable; middle distance, generally pronounced by the uninitiated to be ice covered with snow, and which only the connoisseur knows to be the photographer's hieroglyph for water, and the foreground made up of black masses dotted with white, known only by general outline to be trees. Photographs of this well known class will soon be covered with the dust of oblivion. Much has been said in defence of photography, During its early struggles its artistic shortcomings were explained away, and the dilletante exclaimed, in order to judge fairly this wonderful art, that has assumed the proportions of Hercules whilst still in swaddling clothes, we must start afresh. All the time-honoured rules, the study of which only has given us our present knowledge on art matters, are useless, for this new art sets them all at defiance.

By degrees the taste in photographic matters became insensibly depraved, and for several years the productions most commended were those where the *manipulative* skill was most apparent. The lens that produced a result upon the sitter as powerful as that effected by the ghost of Hamlet's father, aud made—

> "Each particular hair stand on end
> Like quills upon the fretful porcupine,"

was the one "applauded to the echo." A mania for black tones followed, and was succeeded by one for landscapes of

* Read at a meeting of the South London Photographic Society on the evening of Thursday, March 21, 1861.

gigantic proportions. All these efforts of the unsatisfied speculative mind have not been in vain; but they have been too much in a wrong direction. The French, with a truer taste than ourselves, were dissatisfied with the larger landscape productions, and instead of devoting themselves to this branch of photography, pointed their lenses towards the façades of their magnificent cathedrals. They have, in consequence, produced *pictures* the like of which had never been seen since the world began. The skies in these pictures only make more clear and distinct—

"The high embowered roof
With antick pillars massy proof
And storied windows richly dight."

Many of them are, indeed, so perfect in every sense that they have (to borrow again from the immortal Milton) "dissolved us into ecstacies."

Le Grey is the man who has spanned the gulf that separated photography from the fine arts. We regard him as the pioneer of the new era in photography, and Wilson and a few others have formed the advanced guard. When we look at Wilson's later productions, and see that water—usually so imperfect and naked in photographs—can be produced with all its undulations, its thousand lights and shadows faithfully pourtrayed. When we see it proven that the sun—generally regarded as so fierce in some of his moods—has calmly looked on while the daring photographer has "taken a sight" at him, and even has smiled upon his efforts, and left the impress of his beaming face upon the sensitive plate. When cloudy sky and stormy sea can be portrayed with equal facility, we cannot help feeling that the future before us in photography lies in the perfecting of every means and appliance that can tend to make instantaneous pictures of every size easy of production. As one of the most difficult operations in instantaneous photography is the bringing up of the image to a sufficient degree of intensity we propose to devote our attention this evening to those of the many intensifying processes which we have practically tested. In doing so, we feel no apology necessary. Our chief aim is to cause discussion upon this important part of all instantaneous processes. We shall simply record our own experiments, and doubt not but that in the discussion much valuable information from our practical members will be elicited as to the best means of getting over the difficulties which beset most of the intensifying processes.

At the outset, we would say that if it be possible to bring the picture up at once into anything like a printable condition, we would most certainly not adopt any of the after methods we purpose mentioning. The best means of producing negatives with the requisite intensity is to employ a bath quite neutral, a collodion made with at least as much alcohol as ether; in many cases we would use 2 parts of alcohol, sp. gr. ·800, to one of ether, ·750, iodized with iodide of cadmium 4½ grs., bromide of cadmium 1½ grs. to each ounce of plain collodion.

We consider the preparation of the cotton for this collodion a most important matter, as so much of the after success depends upon the temperature at which it is made. That which we have employed was made with weak acids, at a temperature just below the dissolving point. We have not time now to go into the formula, as we have other things to consider. We hope to do so, however, on some other occasion.

The developer we employ is as follows:—

Iron	30 grs.
Acetic acid	15 ,,
Acetate of soda	1½ ,,
Water	1 oz.

With the collodion we have described, and this developer, we secure an image which comes up slowly, gradually acquiring during the operation what appears to the eye a fine black image, but which, when fixed and brought out to the light, shows that fine peach-like bloom which is so great a charm in negatives produced by the pyrogallic acid. The application of pyro, and a few drops of nitrate of silver completes the operation.

Could we always succeed with this process in securing as much density as is desirable, our task would soon be over; but unfortunately there are many subjects where this totally fails; therefore the need of one of the many after processes of intensifying which we will now proceed to describe. We beg, however, to say, before we go further, that we are not going to announce anything new or startling. We shall simply record our experiments, and send round results produced as nearly as possible at the same time, and under the same circumstances, so that the processes may be fairly tested side by side.

The first one is produced by the agency of a saturated solution of bichloride of mercury, and, after washing the plate, a few drops of a saturated solution of hypo in half an ounce of water is poured over, and the plate well washed. This plan answers well for many subjects; but the tendency is to produce harshness unless the picture has received a slight excess of exposure. The same objection applies to the application of a weak solution of ammonia after the treatment with the chloride of mercury. The great objection to this, or any plan where mercury is employed, is the tendency the film has to split off in drying. This can only be remedied by rejecting any collodion that is at all contractile, and employing one containing not less than five and a half grains of really soluble pyroxyline to the ounce. Another evil, scarcely less than the one just named, is the production of crapy lines in the negative when dry. The remedy for this is a collodion of equal parts of alcohol and ether, and to use solvents as free from water as possible. Crapy marks in a negative indicate invariably the presence of water in the collodion.

The next plan we will mention is one that, a few years ago, was quite a favourite with us. After the application of pyro and silver, should anything further be required, we poured over a very weak solution of bichloride of mercury, draining it off and pouring it on two or three times, until the surface appeared covered by an even coating of black. We did not allow the image to whiten, but washed immediately. On holding the negative up to the light much that was very weak, especially in the half tones and lighter shadows, were brought up, while the powdery nature of the film permitted the light to act much more powerfully than would be imagined, judging from the appearance of the negative. This application of a weak solution of bichloride of mercury for so short a time does not make the film tender, and one of the greatest difficulties is thus overcome.

The next we will mention is the application of iodide of mercury. If a weak solution of bichloride of mercury be poured over the image, and, after washing, a solution of iodide of potassium is spread over in like manner, a yellow image is formed, caused by the precipitation of iodide of mercury upon the silver image. If these solutions are poured over alternately twice or thrice, perfect chemical opacity will be produced in the high lights of the negative, and, by comparing the back of the picture with the front, it will be seen from its conversion into a bright yellow, that the image is composed of iodide of silver as well as mercury. This kind of picture is not at all desirable in an instantaneous process; we would, therefore, recommend a different plan. If we add iodide of potassium by degrees to a solution of bichloride of mercury, a dense scarlet precipitate is thrown down. The clear liquid left after subsiding will produce the yellow image, but still frequently with too much density. There is also a danger of producing marks and stains in pouring on which no after treatment will remove. But if we continue to add iodide of potassium we shall find this dense red precipitate gradually taken up, until it is all dissolved in the excess of iodide of potassium. If we now apply this solution to a negative we shall find its fierce propensities very much curbed. The first effect is to produce blackening, and it goes on gradually until a very harmonious negative is produced. This method has many advantages over the other applications of mercury. If you obtain a well developed positive, with all the detail plainly visible after very careful washing, it can be put in the plate box and left until you reach home; for it acts as well upon the dry as upon the wet surface. Of course it is necessary to wet the film with water before the application of the solution.

The last method we shall mention is one that in our hands has given the best results, affording at the same time the greatest facility of modification. It is the application of an aqueous solution of iodine. We have never seen this plan given in any of the journals, and we felt assured it is known but to few. Tincture of iodine has long been recommended, and, when only a slight increase of density is desired, it answers very well, followed by pyro and silver. The advantage of the new method is, that you can secure as much or as little intensity as you may require by employing a strong or weak solution. In using alcoholic tincture of iodine great difficulty is experienced in making the alcoholic solution unite with the aqueous one, and frequently stains are produced during the operation. By the following plan the difficulty is obviated :—

The method of producing a solution of iodine in water is, doubtless, known to many; but for the benefit of those not familiar with the plan, we will describe it. If a drachm of iodine be put into a 4-oz. bottle, no solution will take place; but if iodide of potassium be dropped in, a change is immediately produced; first, a yellow colour is produced; on adding more, a beautiful crimson appears, until, on frequent additions, the whole of the iodine is dissolved, and a deep-coloured solution remains. This stock solution can be diluted according to the intensity required. We always judge by the colour the strength necessary to produce any effect we want. If a negative require but a little vigour, then we apply a solution in colour between sherry and port; and let it remain on a few seconds. On holding the negative up to the light, a very decided change will have been produced. More intensity will have been imparted to all parts of the negative, without having changed in any material degree the general appearance of the image on the surface. If, however, the picture be thin, then a strong solution may be applied, and poured on and off until the image comes out as a beautiful positive full of delicate half tones; and of a very pale primrose colour. A little pyro and silver will complete the operation.

One great peculiarity we have noticed in negatives so produced is, that on holding up the primrose image to the light, a ruby colour, inclining to the complimentary purple, is seen. But on looking at the surface, nothing but the bright primrose colour is visible.

There are many other processes possibly yielding good results in the hands of those who have given attention to their peculiar requirements. Among others, there is the chloride of palladium, but as it is more expensive, and does not yield results better than some we have mentioned, we have not introduced it. Indeed, the opinion of those competent to judge is, that it is not equal to several we have described.

Our task is now done. Believing that the *modus operandi* of the veriest tyro may convey some hint to the thoughtful experimentalist, and may be instructive to many—if only to serve as a warning beacon, pointing out some photographic shoal or quicksand to the wary voyager—or confirming the established chart, we shall sit down content to learn in the discussion how little or how much is considered useful to the many. And if, however imperfectly our task may have been performed you will take the will for the deed, we shall be more than repaid.

Proceedings of Societies.

South London Photographic Society.

The monthly meeting of this society was held in St. Peter's School Room, Walworth Road, on the evening of Thursday, the 21st. The Rev. F. F. Statham, B.A., F.G.S., in the chair.

The minutes of a previous meeting having been read, the following gentlemen were elected members of the society :— Messrs. Price, Warner, Quentery, Gridley, and Samuel Fry.

The Chairman called attention to Mr. Mudd's fine picture of "Coniston Falls," which had been selected by the sub-committee, appointed for the purpose, as the presentation print to the members of the society, and proposed a vote of thanks to Mr. Mudd for placing such a valuable picture within the means of the society.

The Secretary called attention to some prints which presented, in the first-place, advantages to the painter who might wish to colour them, from the delicacy of the detail in foliage, &c., having perfect definition without any approach to blackness, and a second advantage in their suitability for transparencies from their vigour and beauty by transmitted light. These characteristics were obtained by placing the side of the paper which had not come in contact with the silver sensitizing solution next the negative in the printing-frame, and causing the printing to take place through the texture of the paper.

Mr. G. Wharton Simpson called attention to a panoramic picture by Mr. Penny, of Cheltenham, produced by two exposures in succession on one dry plate. (See Photographic News, p. 141.) The plate from which this picture was propuced was prepared by the tannin process. The picture elicited much admiration, both for the ingenuity of the idea, and the excellence of the photograph.

Mr. Valentine Blanchard then read a paper on "Intensifying Processes as Adjuncts to Instantaneous Photography." (See page 150). Several instantaneous stereo negatives of street scenes, with moving vehicles and foot passengers, and prints from them, were passed round to illustrate the processes.

Mr. Samuel Fry said he had been struck with the regular progress in the value of the processes explained by Mr. Blanchard as illustrated by the photographs exhibited, and especially with the fact, if he rightly understood it, that such pictures could be taken in such weather. That they were absolutely instantaneous was manifested by the fact that no blurring was apparent in the moving figures in the busy traffic of a London street scene, and this with London light in a March day was certainly striking and important. In his own experiments in instantaneous photography he had had, like Mr. Blanchard, difficulty in getting sufficient printing vigour without recourse to intensifying processes. Pyrogallic acid as a developer would generally give sufficient intensity, but it required longer exposures. Iron undoubtedly was of the utmost value as a developer in instantaneous work. The process of intensifying which he used most, and found successful, was analagous to one of those mentioned by Mr. Blanchard. It consisted in the application of a solution of bichloride of mercury, followed by a solution of hydrosulphate of ammonia. This produced a negative of a yellowish brown colour, of very considerable printing intensity. The plan last-mentioned by Mr. Blanchard, which gave results much superior to the others, appeared to be all which could be desired. He thought, in all instantaneous photography, too much importance could not be attached to the value of a bromo-iodized collodion and iron development. Regarding Mr. Blanchard's specimens, he should certainly have liked to have seen something larger than stereo plates, but he knew this was hoping too much at this time of the year, and nothing could be more suitable than those exhibited for illustrating the processes described.

Mr. Blanchard explained that in order to make the experiments as satisfactory and complete as possible, he had thought it important that they should all be taken under, as nearly as possible, the same circumstances and conditions. He had discarded other specimens he had, in order to produce the whole before them in one day, and as rapidly as possible, one after another. Press of professional duties had driven him to the the last day, and the whole of the negatives had been taken, intensified and finished during the day, and the pictures from them had been printed, toned, fixed, washed and mounted since four o'clock that afternoon. Of course nothing could be said of their permanency, but they served the present purpose.

Mr. Hughes remarked that if the practice of instantaneous processes were found possible with large plates, the future of photography would assume altogether a different aspect to what it had hitherto done. The time had been when the great complaints in regard to any attempts in this direction had been of the extreme hardness and deficiency of half-tone. The difficulty now seemed to lie in the other direction. All who had worked with a bromo-iodized collodion in a weak light were familiar with the thin phantom image, and it certainly was an interesting point to determine the best methods of intensifying such images so as to retain delicacy whilst acquiring strength. Regarding the use of bi-chloride of mercury, it had generally been regarded as having a tendency to fill up delicate details, and ignore half-tone. Mr. Hardwich had remarked that its utility was chiefly confined to copies of engravings in which half tone was not necessary. The experiments and specimens of Mr. Blanchard possessed a peculiar interest as showing the different results given under the same circumstances by the different agencies employed. In regard to the methods themselves, many present had been long familiar with them, but perhaps no one before had given such a valuable comparative view of their respective degrees of fitness for the work required of them. The last-named process in the paper appeared undoubtedly the best, as giving the most vigour combined with delicacy. The process there named, although probably older and better known than Mr. Blanchard fancied, was still not so well known as it ought to be. It was given in Mr. Hardwich's fifth edition, and spoken of with confidence, but in the last edition some doubts were expressed of its value. In a practical question like this, and one the value of which would largely depend on manipulation, Mr. Blanchard was probably a better authority than Mr. Hardwich. The great value of these experiments, was the confidence with which they shewed such methods might be adopted, the great power in this direction, which they illustrated as lying in reserve. The use of bi-chloride of mercury, it was known to most of them, gave continued risk of destroyed films; all might go right until the drying, and then the picture was found to be a "thing of shreds and patches." He had been struck with one remark of Mr. Blanchard's, that relating to the use of cadmium alone as an iodizer for alcoholic collodion. That was certainly a different doctrine to that entertained generally, and promulgated by the great advocate of alcoholic collodion, Mr. Sutton, as it was considered that the combined use of cadmium and excess of alcohol, had a tendency to make the collodion unmanageable by gelatinization. He would be glad to know in what proportions Mr. Blanchard had used the alcohol.

Mr. Blanchard stated, that he had used the ether and alcohol in equal proportions, and had found he obtained a most limpid fluid collodion with cadmium.

Mr. Hughes remarked that these proportions scarcely constituted what was called alcoholic collodion. In conclusion, he would remark that almost all the intensifying processes had been proposed years ago, and were quite old, but that in the present state of photography it was sometimes quite as useful to revive past knowledge as to seek for the unknown.

Mr. Fry said there was another plan of getting vigorous negatives from faint negatives having no printing qualities. He referrred to the method of producing first a transparent positive by superposition from the the weak negative, and from that transparent positive a negative: by using processes giving intensity at each stage, any amount of vigour in the final negative might be obtained. He had called at King's College recently, and Mr. Sutton had there shown him a negative, taken, he believed, by Mr. Llewellyn, by the oxymel process; it was so weak and thin that it would have been useless for printing purposes. A transparency taken from it, however, by superposition, on a tannin plate, was full of vigour and intensity. From this, of course, the next plate would be a negative. The plan was extremely valuable, and might be effected either by superposition, or copying in the camera.

Mr. G. Wharton Simpson wished to endorse Mr. Fry's remarks as to the value of this process, either for multiplying negatives the same size, or producing them on an enlarged or reduced scale. From even a very weak positive, so long as it possessed all the detail properly marked, however faintly, very vigourous negatives might be obtained. There was a case in point which it was worth while to recall in support of this position; he referred to the fact that one of the illustrations of Mr. Piazzi Smythe's work on Teneriffe was produced to the number of some thousands, from a glass positive which had passed some months of its existence with black varnish at the back. This on being removed permitted a transparency to be produced by transmission, and from the transparency the negatives required. This process had some advantages over intensifying processes upon the original picture, from the fact that it involved no risk to the original, whilst all intensifying processes certainly involved more or less of danger to the film. Any number of negatives of any size could, however, by this method of reproduction, be obtained without risk to the original, and with such varying degrees of intensity as occasion should suggest. In regard to the use of a cadmium iodized with alcoholic collodion, having experimented somewhat largely in that direction, he might remark that with a proper pyroxyline cadmium might be used with the solvents in equal proportions without any difficulty, he had used it with two proportions of absolute alcohol to one of ether, but there was a tendency in that case to become glutinous and unmanageable, and wherever that proportion was used he preferred half of cadmium and half of some alkaline iodide in the collodion. The proportions originally proposed by Mr. Sutton in the alcoholic collodion proper, were, he believed, four-fifths of absolute alcohol to one of ether, and in that case, cadmium could not be used with advantage.

Mr. Eidmann said, he did not think it probable that a good negative could be obtained from a weak positive as stated. He thought, if the half tone was weak in the original, it would be entirely absent in copies.

Mr. Simpson assured Mr. Eidmann, that this was not a question of probability, but of fact. The method was well known to many photographers. Of course, the reproduction could not possess detail that was absolutely absent in the original; but all that was there could be obtained in a more vigorous degree in the negative. He had repeatedly done it himself, especially for producing enlargements.

Mr. Eidmann referred to the advantages of a mixture of gallic and pyrogallic acid with silver, as an intensifying process.

Mr. Hannaford asked Mr. Blanchard the proportions of iodide and bromide he had used in his collodion.

Mr. Blanchard stated, that he had used four grains and a half of iodide, and one grain and a half of bromide.

Mr. Hannaford remarked, that the proportion of bromide was larger than was usually recommended. He had used as much as a grain, but not more, and then he found a tendency in the picture to be too weak; but that very quality was a recommendation where intensifying processes were used, as the picture required for such purposes should be full of detail, but did not require intensity. The greatest evil of all processes in which intensity was gained by a thick deposit of silver was the fact that fine lines and delicate details got clogged and filled up. The great advantage of a good intensifying process was, that it allowed the collodion to be used in its most sensitive form, without regard to intensity, rapid exposure being the only consideration. He had recently been making some experiments with the use first of a solution of bichloride of mercury, followed by a very dilute solution of iodide of potassium, and was pleased with the promise it yielded. There was one point of importance to know in connection with this subject; it was, that if too much intensity had been obtained, it could be reduced by applying a stronger solution of iodide of potassium to the film, as iodide of mercury was soluble in excess of iodide of potassium. Care, however, should be used not to carry this too far, or the intensity might become so much reduced that it could not be regained. There was another point which might be worth attention; he thought if the film were dried before applying the solution of mercury, the danger to the film might be less. He threw this out as a suggestion.

Mr. Blanchard said one of the negatives before the meeting had been done so.

Mr. Hannaford added in regard to the question of obtaining a vigorous negative from a weak and useless one, he had done it himself often, and he had also done the reverse, obtained a soft negative from one which was too intense. The process of reproduction in that way admitted of much latitude in the result to be obtained, with a little knowledge and skill almost any class of picture might be thus reproduced. He would conclude by suggesting that some attention be given to intensifying processes in connection with dry plates, and recommended that subject of the attention of the Experimental Committee.

The Chairman made the remark, that if the soluble cotton for a collodion were of suitable quality, made with weak acids at a high temperature, it might without disadvantage be iodized with cadmium, even though the solvents were in the proportion of five parts of alcohol to three of ether, or even six parts of alcohol to three of ether, and referred to a gentleman who was very successful who used such a collodion.

Mr. Simpson remarked that Mr. Hardwich had, in his last edition, given a formula for pyroxyline intended especially for a cadmium collodion. Referring to the question of the proportion of bromide, he might remark that he had just had a letter from Major Russell, in which he recommended for his tannin process as much as two grains to the ounce, and three of iodide.

Mr. Blanchard remarked, in reference to the reduction of intensity by a strong solution of iodide of potassium, the continued use of the mercury solution would have a similar effect.

After some further conversation, a paper on "Sharpness," by Mr. Wall, was announced for the next meeting; and, after the usual votes of thanks, the proceedings terminated.

Photographic Notes and Queries.

Drying Box for Prepared Plates.

Sir,—As we should always be ready to impart improvements in the photographic line to our fellow photographers, I beg your permission to submit the following description of a box I have used for some time with great success.

The box is made of double tin three-eights of an inch all round, and also a partition of the same in the middle. This tin box is enclosed in a mahogany one, in order to keep in all the heat. It is advisable of course to have the outer box made of some hard wood that heat will not warp. The tin is made to project about half an inch above the box to allow for the cover shutting down light-tight. In a suitable corner on the top of this tin box I put a hole as large as possible with a screw to fit into it. Through this hole the hot water is poured in—a small funnel is of course necessary for doing it. At the bottom corner of the box on the side I put another hole with a small pipe fitted to it, projecting about half an inch beyond the wooden box also fitted with a screw, which is for emptying the tin box when the water has become cold.

On the sides of the tin box are placed small pieces of tin, top and bottom, about one inch long, and projecting just enough to slide the plate on. Of course, these pieces of tin must be put on an angle, as the plate will have to stand so for draining. After having prepared my plate I simply slide it down in the box (having put previously two or three thicknesses of blotting-paper all along the bottom)—when I find that the plate is dry in from six to eight minutes, according, of course, to the temperature, which I find never beyond "blood heat," even with boiling water, so that the films are not at all injured. In this manner I have prepared numbers of plates, and have found them equal to those dried spontaneously. I have found that the best plan is to prepare say a dozen plates before putting in the boiling water, as it gives the films a little time for draining.

The box I have holds sixteen plates, any number of course in proportion to the size of the box. I allow one inch between each plate for draining room. The cost of such a box, including lock, handles, and black japanning of the tin, was eighteen shillings; but, for those living in a large town, it could be made, I should think, for twelve shillings.

I was quite surprised, and at the same time glad, to read in your News the other day, that Mr. Fry was patronizing a similar box, as I had thought that mine was perhaps the only one of its kind.

I would just add, that I have practised with success Mr. Howard's plan of the "Fothergill Dry Process," as given in your News a week or two back; and would advise all those who want to adopt a dry process to try the "Fothergill," with Keene's collodion, as I believe, and I have found it so, the most simple and most sure process, if cleanliness is strictly observed. I have not tried the "Tannin Process," but will do so very shortly, especially if, as they say, it beats the "Fothergill" in exposure.—Yours very truly, J. A. Clements.

Ventnor, Isle of Wight, March 22, 1861.

Folding Backgrounds.

Sir,—Could you, or any of your correspondents, inform me how to make a background 6 feet by 6 feet, with a hood about 3 feet by 6 feet at the top, to increase or diminish the top light, so as to be able to fold it up in lengths of about 3 feet, and carry it to friends' houses? (The wood, I suppose, might be managed in some way with hinges, but the calico painted as generally ordered, I should think, would flake up, and show all creases made in it.) Also, the probable cost?—I remain, yours sincerely, W. H. H.

Clapton, March 17, 1861.

[Some of our readers may be able to give our correspondent a hint. A background painted in distemper would be apt to crack. Painting in oil and flatting might answer the purpose; or a very wide woollen fabric, such as is used for making ladies' mantles, might answer.—Ed.]

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 26th March, 1861.

M. Fargier has communicated to our Photographic Society the details of his carbon-printing process. The essential condition of success is that the mixture of solution of gelatine and carbon be very intimate. When this result is attained, the mixture is spread on a flat piece of glass, and then slowly dried by a gentle heat. Once dry, the plate is exposed under a negative in the ordinary printing-frame. Three or four minutes exposure in the sun will be found sufficient; the result may be estimated by approximation; it may, however, be arrived at exactly by placing a piece of nitrated paper in the pressure frame, for the time required for exposure is nearly the same both for sensitized paper and the glass bearing the mixture. On removal from the printing-frame the latter is covered with non-iodized collodion, in sufficient quantity to form a film as thick as a sheet of paper. This done, the glass plate is put into warm water, collodion uppermost; the latter soon swells up, and is retained only on its edges, which may be detached from the glass by the thumbnail; the water penetrating under the film removes the soluble portion of the mixture, and the carbon it contains; the collodion film floats in the liquid, the glass is then lifted out, the water being renewed two or three times, and lastly the picture is transferred to a sheet of gelatined paper.

M. Peligot proposes that the residues of photographic operations be treated in the following manner:—These residues, which contain hyposulphite of soda, pyrogallic acid, sulphate of iron, cyanide of potassium, acetic acid, and salts of silver and of gold, &c., are usually treated with *liver of sulphur*, which precipitates the last three metals in the state of sulphides. The employment of liver of sulphur presents many objections; its bad odour is very objectionable; and the sulphuretted hydrogen is apt to spoil photographs exposed to its influence. And the presence of sulphide of iron renders the reduction of salts of gold and silver more difficult. A better method consists in introducing into the residues (which are generally alkaline), a thin plate of zinc, and leaving it there for four and twenty hours. The silver and gold are precipitated in the metallic state. It may be ascertained if the precipitation be complete by taking a small quantity of the clear liquid and boiling it with hydrochloric acid. It will produce a deposit of sulphur which should disappear on the addition of a few drops of nitric acid. If any silver remains in the liquor, it will be precipitated under the form of chloride of silver. The black powder of gold and silver is then treated with diluted sulphuric acid, and washed upon a filter. Some of the metals adheres to the plate of zinc, this may be removed by brushing it off under water. The zinc plate will then serve for fresh precipitations. The filter is burned, and the mixed metals, with a little salt of soda and borax, are melted in a clay crucible. The metals treated with nitric acid yield nitrate of silver; the gold remaining in a pulverulent state. This method appears to be the most simple, practicable, and economical yet made known.

M. Niepce de Saint Victor suggests that paper for receiving the image in the solar camera be prepared with chloride of silver, as usual, but that after a short exposure the image be developed with gallate of lead. A cold saturated solution of gallic acid is prepared, to which is added some gallate of lead. When boiled it dissolves a certain quantity of this salt, it is then filtered, and when cold a few drops of acetic acid are added. The chlorided paper will require only a few seconds exposure in the camera, as with iodized paper. The image appears very quickly in the developing bath. The whites remain pure, while the blacks acquire great intensity. The proofs are toned with chloride of gold, and fixed in the usual manner.

A very interesting series of researches has been made by M. Jules Regnault, on metallic amalgams, and the origin of their chemical properties. In a preceeding report, he has stated that the chemical properties of amalgamated zinc and cadmium resemble the thermal phenomena accomplished at the moment when these two bodies unite with mercury. His new researches have led him to generalize these relations; they extend to a great number of metals, and prove that the one, as zinc for instance, rise in the scale of positive affinities, while others, as cadmium, on the contrary, become lower by amalgamation. Among these metals, those which become electro-positive on becoming allied with mercury, are the following:—

Iron	Zinc	Copper
Nickel	Tin	Lead
Cobalt	Antimony	Bismuth

Zinc, tin, and lead are the only ones among these bodies which, by simple contact, and without auxiliary, physical, or chemical action, enter into combination with mercury. M. Regnault has proved that the amalgamation of tin and lead is accompanied in the same manner as with zinc, by a striking reduction of temperature. Therefore, in the three cases where the temperatures can be measured directly during the reaction, we find that the positive affinity of the compound increases when its heat of constitution augments. We may reasonably conclude that the other amalgamated metals in which identical properties are observed, owe them to the same cause. The comparison of their latent heats of fusion and of the chemical rank which they occupy is very favourable to this view. Iron, nickel, and cobalt have an affinity for mercury very slightly different from that of zinc, and as, also, their latent heat is unquestionably superior, the increase in the positive affinity of the amalgams is a result of the heat confined in the latter. The electro-chemical properties of the amalgamated metals, iron, nickel, and cobalt, is also explained on the same principles. For if, on the one hand, their latent heat is generally inferior to that of zinc, on the other hand they unite with mercury by virtue of an affinity so feeble, that the formation of the alloy, as can be verified for tin and even for lead, is a source of reduced temperature. As to the metals with cogeneric cadmium, that is, those which disengage heat upon amalgamating, and which, according to the theory, ought to become lower in the order of affinities, they are found in the group of metals placed at a great distance from mercury by their electro-positive character. Their combination with the latter is the result of an energetic affinity, and as their heat of fusion seems otherwise to be feeble, the production of heat during the reaction manifests itself with a remarkable intensity. Potassium and sodium, the amalgamation of which takes place with such a disengagement of heat that the temperature reaches the point of incandesence, has supplied the means of giving a new control to these ideas. Conclusive experiments also prove that the amalgam of potassium and sodium formed in virtue of these powerful affinities, are negative relatively to the pure metals. Mr. Regnault concludes, from his researches, that whenever a metal is amalgamated, its position in the scale of affinities undergoes a modification. The result may be in the opposite direction, even for neighbouring metals, for it depends both on the chemical function of the metal, and on its latent heat of fusion. If there is a reduction of temperature during the combination of the metal with the mercury, if, consequently, the heat of the constitution of the amalgam is greater than that of the metal, the latter rises in the order of affinities. When the whole of the thermic phenomena are reversed, when the alloy is formed wiih disengagement of heat, the amalgamated metal is negative relatively to the free metal.

M. Charles Tissier suggests a means of refining metals, especially copper, by the agency of sodium. The difficulty experienced in removing the last traces of sulphur, arsenic, phosphorus, carbon, and silicium from the metals with which they are combined, is well known; often impairing their good qualities to a very great degree. The manufacture of aluminium has led to the production of sodium in large quantities, and it may now be obtained at a very moderate price. Sodium is admirably adapted to the ultimate refining of a good number of metals; the expense of employing it in the refining of copper, even to the extent of a 200th part, which is an extreme quantity, would not militate against its use on the score of economy. Sodium acts by forming with sulphur, phosphorus and arsenic, alkaline sulphates, phosphates, and arseniates, which rise to the surface of the metal in the form of scoriæ. The carbon and silicium are in their turn removed by the soda formed during the operation; and, in separating, the one forms oxide of carbon, the other alkaline silicate. Antimony, bismuth, and the analogous metals which have much more affinity for sodium than copper has, form with it very oxydisable alloys, which produce a cupellation similar to that effected by lead: lastly, the oxydule of copper, which very often contributes to acidify this metal, is immediately decomposed by this energetic agent.

The promptitude with which the vapour of sodium acts when passed through the metal in a state of fusion, leads to the idea that its employment will play a great part in metallurgy, and that it will greatly simplify the purification of cast-iron, and its conversion into malleable iron.

THE TANNIN PROCESS.

Sir,—Within the last few days I have found out that some statements contained in my letter to you last week require a little correction. The plan for working the tannin process without the coating of gelatine, is not to be depended on. With some collodions it works well, but does not answer with others, especially if thick, so I cannot recommend dispensing with the gelatine.

I have often kept the glasses covered with gelatine in the manner described, and always without injury until very lately, when some which had been long kept showed round black spots in the negative, apparently from fungus, caused probably by damp air getting access to the plates. A glass simply cleansed and kept in the same box was affected in the same way. It appears from this, that it is best to use plates recently covered with gelatine, if they cannot be kept perfectly dry. The tannin solution may be used of almost any strength, but I find that the stronger the solution, the more acid should be used in the silver developing fluid. If 30 grains of tannin to the ounce be employed, 20 grains of citric acids should be dissolved with 10 grains of nitrate of silver.—I am, sir, your obedient servant, C. Russell.

Stubbers, West Romford, 25 *March*, 1861.

Sir,—There is but one very assailable imperfection in the tannin process, viz., the wrinkling of the film; this I can obviate by drying the sensitized and and washed film before putting on the tannin (in stereo plates), it also seems to be an unnecessary strength to have a 30-grain bath in this process, for I have a 15-grain one which answers with the tannin process; and probably an excess of silver would be sufficient if of far smaller strength than this—may it not be the same with all *dry* processes? for the concentrated silver bath is only available in the wet collodion to help to impress the film and aid in development; if you have not heard of a better plan for doctoring the film, you may probably like to make it known to your readers.—I am, sir, yours, &c. W. Bartholomew.

Fareham, March 23, 1861.

[One of the objects of the application of the tannin solution is, we apprehend, to keep open the pores of the collodion film; and in applying after drying the film this object must be lost.—Ed.]

Talk in the Studio.

Photographic Soiree.—The President and Council of the Photographic Society have just issued cards of invitation for a soiree to be held at King's College, on the 4th of April next. It is expected that many of the photographs now exhibited in Pall Mall will be taken to King's College for the occasion.

Photographic Exhibition.—The Exhibition in Pall Mall closes on the 30th inst.

Photographic Grouping.—The *Athenæum* has not a high opinion of the artistic powers of photographers generally. Speaking of a photograph of the officers of the 84th Regiment by Messrs. Agnew and Co., of Manchester, it says, "it is not only a good specimen of photography, but remarkable as illustrating the success of a common-sense course of proceeding in the matter of placing the sitters—generally the very point in which the operators fail most lamentably, for the simple reason that composition is one of the most subtle branches of an artist's study—a quality, indeed, of which there have been fewer masters than any other. The operator has placed, or allowed them to place themselves, the whole body of the officers, over forty in number, the majority standing, a few seated in front. With the felicity that sometimes attends chromatic combinations in the kaleidoscope, they are perfectly grouped in simple masses.

Patent for Photographs by Artificial Light.—A patent has been taken, in the United States, by Messrs. P. F. and W. S. Dodge, of Cambridge, Massachussetts, for taking Photographs by Artificial Light. Their claim runs as follows:—We claim the combining with an artificial light, and one or more series of reflectors, of an intercepting medium or plate, when so arranged with respect to the object, and the light and reflectors, as to intercept or soften the dazzling rays from the light, and allow the unobstructed rays to pass from the light upon the reflector and thence upon the sitter, substantially as described. We also claim the peculiar arrangement of the upper and side reflectors together, so that the side reflectors cast their reflected rays upon the object, while the upper reflectors cast not only the rays thrown upon it by the light upon the object, but also throws upon the object the reflected rays from the side mirrors, all as set forth."

Pyroglycerine.—A substance resembling pyroxyline in some of its characteristics, and of a most powerfully explosive character, called pyroglycerine, and also "explosive glonoin," has been obtained by the action of a mixture of nitric and sulphuric acids upon syruppy glycerine. The process closely resembles that by which gun-cotton, and other similar explosive compounds, are obtained by the action of the same acids on cotton wool, and other substances composed largely of carbon. Mr. Ferris, an American chemist, nearly lost his hearing by the accidental explosion of about thirty grains of the pyroglycerine. A single large drop will explode with a report as loud as that of a gun.

Panoramic Photography.—The importance of producing pictures with a much wider angle of view than is usually obtained is beginning to excite much more attention than formerly. A correspondent last week described a method of taking such views at two operations very ingeniously; but that, of course, could only be used where the error in perspective did not become striking. We saw a few days ago an exquisite picture taken by Mr. Wilson, of Aberdeen, with one of Mr. Dallmeyer's triple lenses. This picture included the widest angle we have yet seen effected on a flat surface, the angle being nearly 70 degrees. The picture contained clouds, &c. very perfectly defined, and appear to have been instantaneous. There was also considerable depth of focus. There was, unquestionably, some falling off of light at the corners; but we understand the lense was used with its full aperture, a condition for which it is not usually intended. The rapidity of action which an instantaneous picture indicates, is certainly a feature we had not been led to anticipate in these lenses. We have not yet tried them ourselves, but hope to do so shortly. The sight of this picture certainly affords an additional inducement to do so.

Photography and Morbid Anatomy.—Mr. Geoffroy Saint-Hiliare has just presented to the French Academy of Science a photograph of a youth, fourteen years of age, who has a peculiar malformation, which has been called "péadelphe." His right leg is divided into two limbs, both terminated by feet, which, however, point in opposite directions.

To Correspondents.

*** Articles on Working Wet Collodion in the Field, by Mr. Vernon Heath; on Printing on Ivory, by Mr. Samuel Fry; on Albumenized Paper, by Mr. Maxwell Lyte, and several other articles and letters from correspondents are compelled, from press of matter, to stand over until next week.

F. N. S., Cambridge.—Our correspondent asks if it be possible to take negatives on glass with albumen alone. We are somewhat at a loss as to his meaning. If he mean by "alone" without collodion as well, there have been two or three articles in our columns within the last few weeks, giving details. If this be not his meaning, he must be a little more explicit, and we shall be glad to answer him further. There is no separate work on transparencies that we know of. There have been many articles in the Photographic News from time to time, and there will be another, more complete one in the course of a week or two.

A Learner should be careful to follow formulæ carefully if he desire good results. In the instructions given in the Almanac we were careful in directing the addition of silver to the pyrogallic solution, to say, "not from the bath," but from a solution prepared for the purpose. The use of silver from the bath under such circumstances, often causes fogging, especially if the bath be an old one. It is often difficult to obtain a sufficiently dense negative by iron alone, unless the collodion and bath be in an especial condition suited to the purpose. See leader in this number, also paper by Mr. Blanchard, and discussion at the last South London meeting.

Juvenis.—The spots on your print are manifestly from something which has accidentally been splashed on to the paper. Hyposulphite of soda coming in contact with the paper before it was excited, would cause similar spots. Your bath is of a good strength, and evidently working very well. Use the kaolin for cleaning it if you find it most convenient. In making pyroxyline, 140° Fah. is a moderate temperature, 150° high, but it much depends on the strength of the acids whether you will obtain a good soluble pyroxyline or not. With very strong acids 160° is not too high a temperature. These things must always be considered in their relations to all the circumstances. With the oil of vitriol of commerce, and nitric acid sp. gr. 1·420 in equal proportions, and a temperature of 150° we have obtained pyroxyline which dissolved easily about eight grains to the ounce of two parts alcohol and one part ether. Be sure you have the right strength of acid, and the right temperature, and if there be any modification in one, make the requisite modification in the other.

James F.—The protacetate of iron gives a more vigorous negative than the protosulphate developer. It may be made by adding 12 grains of acetate of lead to 12 grains of protosulphite of iron, and filtering out the precipitate; or, by adding 6 grains of acetate of soda, instead of the 12 of lead. In the latter case no filtration is necessary. Acetic acid must be added as usual. It should be used as fresh as possible, as it is not a stable preparation.

B. F.—Use a central stop. It is a great convenience to have a set of Waterhouse diaphragms adapted to a lens.

Hypo.—No amount of washing will make a print permanent if it has been imperfectly fixed. New hypo, of about 20 per cent. is the safest fixing solution. From ten minutes, to a quarter of an hour, will generally be sufficient. Developed prints are generally considered more permanent than sun prints.

Positive.—Flatted crown glass generally answers perfectly well for positives on glass. We have had some alabastrine positives nearly four years, which have not changed or discoloured. Melainotype plates are enamelled iron plates; unless carefully varnished at the edges they will injure the bath.

Lady Bird.—Pyrogallic acid is not suited as a developing agent, where the plan of intensifying adopted by Mr. Lacy is used. The class of picture required is full of detail, but not intense; and this is most easily obtained by means of iron development. See first article in the present number. The staining of the glasses by the use of iron development to which you refer is a small matter, as where you succeed in getting a good negative, the chances are that you do not need to use the same glass again; and in any case the glasses are easily cleaned by the use of dilute nitric acid, after the action of iron.

Henry H.—Add to each of the positive baths of which you speak some new solution and filter carefully; and at least another drachm of acetic acid to the developing solution. Regarding your negative bath, you do not state whether it is acid or alkaline, but from the description it is probable a little acid will put it right. The addition of ether and alcohol to a new bath is a useless and foolish proceeding; it will acquire more of these than is desirable very soon. Be sure you filter your bath carefully after adding iodide of potassium, collodion, &c., to it. The only thing in that line that need be done to a new bath, is simply to leave a coated plate in it for a few hours. Spots and comets are more likely to proceed from the collodion than from other causes. For the process given in the article named, any bath in good working order, will answer, and the fixing may be either hypo or cyanide. See articles in present number.

J. C.—The chief advantage of a binocular stereo camera is, that in portraiture both the pictures are taken at the same time, shortening the sitting and obtaining the same expression; and for landscape, that moving figures may be taken, and the same light and shadow always secured in both the pictures. The necessity of cutting in two is a small matter compared with this. Taking the picture with the collodion side towards you would make no difference in that matter; as the relation of the pictures to each other would not be altered. Each picture wants turning round *on its own axis.* The application of a little oil or varnish or anything of that kind will improve a very coarse ground glass for focussing, but nothing will make it perfect. We should change it at once for a proper one. We once tried one for a few months, and finally had to replace it by one properly ground.

C. F. B.—Sends us a couple of very charming stereographs in which water is beautifully rendered. We should like to know the process used in producing the negatives. The printing and toning are also excellent.

Phos.—We cannot answer you at length, as your letter only arrived on the day we go to press. We may remark for your immediate guidance, that if you are working with a collodion such as you describe, that is, with 5 grains of pyroxyline to 2 ounces of solvent, you can scarcely hope to get good negatives. Try double the quantity, at least. We will enter more fully into your difficulties in our next

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 135.—April 5, 1861.

NEW METHOD OF INTENSIFYING.—PREVENTION OF CRACKED FILMS.

We stated last week, in referring to intensifying processes in which salts of mercury were employed, that we had some experiments in progress for overcoming a difficulty commonly met with in these processes; namely, the destruction of the film by the action of the solutions.

The first method to which we shall refer is unique, and consists in avoiding the use of solutions altogether. It will not, however, we apprehend, be extensively used, except by old Daguerrotypists, who will probably possess the appliances and the experience necessary to use them with facility. We refer to converting the film into a yellow iodide of mercury, by the *operation of vapours only*. To do this we have simply made use of our mercury box and iodine box, which were exhumed from a quantity of old Daguerreotype apparatus for the purpose. A thin collodion positive was placed in the mercury box, and the spirit lamp applied to heat it after remaining there some time, the plate was removed and placed over the iodine box, where it gradually acquired a rich bright yellow tint from the formation of iodide of mercury. The yellow tint thoroughly permeated the film and showed alike on both sides; by reflected light it was of a bright canary colour, and by transmitted light a deep orange approaching to red. Although considerable additional thickness of deposit was manifest, the image was transparent in its densest part, and the various gradations were most exquisitely marked, without the slightest tendency to fill up or ignore the finest half tone.

The condition of delicacy of gradation is thus admirably secured. by obtaining printing intensity by means of colour rather than accumulation and thickness of deposit. We have not had opportunity to repeat the experiment at any length; but we may state that we have not been so successful where we applied the vapour of iodine first, and followed with the mercury. The plate is rapidly coated with iodine, and some accession of intensity is gained, but the deposition of the mercurial vapour does not appear so perfect as when the first mentioned method is pursued. A picture which has been submitted to the action of a solution of bichloride of mercury, rapidly acquires the yellow tint when submitted to the fumes of iodine.

As we have said, we do not apprehend that this method will be adopted except by old Daguerreotypists, who will be glad to learn that they have such a power in reserve, and that they can once more utilize some of their cherished apparatus connected with their regretted, but defunct process.

Regarding the methods of preventing the destruction of the film in the processes of intensifying, it is important to ascertain in the first place the causes which operate in producing such destruction. There is no doubt but that the prolonged action of any solution, will, in certain conditions of the film, have a tendency to loosen it and cause it to crack and leave the plate; but this prolonged action, even of a destructive solution, will only have such an effect when the conditions favourable for destruction are present.

We believe the most fertile source of destroyed films is imperfect cleaning of the plate, or the coating with collodion when the glass is not thoroughly dry. Even with a collodion adhering most tenaciously to the glass, and without the action of any destructive solution, this cause will frequently result in cracked films. As an illustration we may mention an experiment we tried the other day; we took two stereoscopic negatives with a collodion which adhered well to the glass; one on a carefully cleaned and dried plate, the other on one which had been carelessly and imperfectly cleaned. The first was treated by almost every possible means of intensifying in succession, iron, pyrogallic acid and silver, solution of iodine, again pyrogallic acid and silver, bichloride of mercury, ammonia, again solution of iodine, and again bichloride of mercury, and finally cyanide of potassium. Of course the printing qualities of the negative were destroyed, but we were trying the power of endurance of the film. It had copious washings between each application, and was under treatment altogether about two hours. It dried finally without a crack, or the film so much as turning up at a corner. The second negative, on a dirty plate was simply intensified by means of bichloride of mercury and ammonia; on drying the film cracked in several places, and curled up like horn shavings, becoming as Mr. Hughes pertinently phrased it, "a thing of shreds and patches." To our own minds this was a tolerably conclusive experiment as to one cause—we believe the most common cause—of splitting of films. The collodion was a bromo-iodized collodion, which had been made and iodized twelve months, the formula for which we have more than once given.

Another very fertile cause of this trouble where mercury is used, arises from the fact that hydrochloric acid forms part of the solution, the formula which used to be universally given, was to make a saturated solution of bichloride of mercury in hydrochloric acid, and add a little of this to water. This acid will always have an actively destructive influence on the film, and it is altogether unnecessary. Bichloride of mercury will dissolve in sixteen parts of water; thirty grains to the ounce forming a saturated solution, which is stronger than is necessary for intensifying purposes. If the salt be powdered and hot water be used, the solution is easily made. Where it is desirable, however, the addition of hydrochlorate of ammonia materially aids the solution, and allows a much larger quantity of mercury to be dissolved, whilst it in no way interferes with its action on the film.

Clean and well dried plates, a collodion not too new or contractile, but adhering well to the glass, allowing the film to set well before immersion in the bath, and the avoidance of solutions containing powerful acids, are the means of avoiding destroyed films, whatever intensifying processes may be used, and the neglect of these means, the sure method of losing the films wherever it is possible.

In conclusion we call attention to a communication in another column, containing the method of intensifying used by Mr. Brothers of Manchester, who is well known as one of our first provincial portraitists. We can endorse Mr. Brothers' statement of the value of the method he gives, from having frequently used it with perfect success.

HALATION: WHAT IS IT?

The last meeting of the Photographic Society proved a rather unsatisfactory *seance*. The chief subject brought under the attention of the meeting was an elaborate paper on halation, its true cause and remedy. The cause was stated to be the action of light, which having passed through the film and glass, was reflected back again on to the film; and the remedy, black varnish. We have no intention of commenting on a paper which we have not before us; but we have no hesitation whatever in endorsing the opinion of Mr. Shadbolt, expressed at this meeting, that the phenomenon there described and accounted for, might be fogging or overaction of light produced by reflection, but was in no sense what is usually understood by halation.

It is important in all discussions to define terms, especially where, as in the brief conversational discussion of Tuesday night, three or four distinct phenomena were referred to as halation. There was, to commence with, this action of reflected light, secondly, that described by Mr. Shadbolt, as halation proper; next the effect produced by the diffraction, or diffusion of light passing through windows into interiors, then the radiation of light from some very bright or white object on to the circumjacent parts, such as that seen on the opening of a waistcoat, where there is a very large expanse of white shirt front; and lastly an effect with which we are not familiar, to which Mr. Malone referred, described as a dark line between a glossy coat and a dark background.

With regard to two of these effects we think the cause is very evident, and does not involve any very occult law. The effect produced in an interior by bright sunlight coming through the windows, may be seen on the ground glass, and therefore requires no explanation on chemical grounds. In some instances the radiation of light, from a bright and white object on to a neighbouring dark one, may be seen easily enough, and was an effect as common in daguerrotypes as it is in the collodion process, and cannot depend on the condition of bath or collodion. That which is known as halation proper was doubtless the effect described by Mr. Shadbolt as a line of increased reduction where a very dark and very light object are in immediate contact, such as the foliage of a tree, and the sky, the deposit being chiefly on the sky, into which it gradually blends.

We venture to offer a theory for this, in the truth of which we know we are supported by some good operators. The deposit which constitutes a photographic image is largely formed by the reduction of the free nitrate of silver on the film; there is as much free nitrate on the dark parts of the image as on the light parts, but a considerable portion of it is not needed at these points; and it cannot be reduced there. The immediate action of the developer on the parts where light has acted, is to reduce the free nitrate in contact with them; and the free nitrate on the dark parts, in immediate contact, which cannot be reduced, is swept by the developer on to the light parts, where, coming in contact with particles of silver in the act of reduction, it also becomes reduced, and in the greatest degree at the first point of contact with the light parts, and gradually less so; forming the effect which Mr. Shadbolt described. How far the sun being near the horizon, as stated by that gentleman, would effect this result, we do not know, nor are we familiar with the fact. The presence of organic matter in the bath to which he also referred, would materially we think aid in bringing about the effect described.

This explanation is consistent with our own experience, and that of many we know; we offer it as meeting the case in the absence of a better theory.

THE TANNIN PROCESS.

We referred last week to a method of using gum in connection with the tannin solution, which had been found successful in counteracting the tendency of the film to leave the prepared plate in the processes of developing, fixing, and washing. The formula used by the gentleman to whom we referred is as follows:—

Tannin	15 grains
Gum arabic	25 ,,
Citric acid	2 ,,
Water	1 ounce

This preparation is used instead of the simple solution of tannin, and has, we understand, a beneficial influence in the resulting negative. The gum seems to act by filling up the pores in the film, and thus to some extent preventing that contraction and expansion to which the tendency of the film to leave the plate is chiefly due. The developing solution more readily permeates the film after exposure, and the action is consequently much more rapid; and there is, moreover, a tendency to preserve the half tone of the picture.

Mr. Hardwich, in giving the details of the tannin process, suggests that gum, in the proportion of from fifteen to thirty grains to each ounce, may be added to the tannin solution, to assist in the expansion of the film on being wetted previous to exposure. We apprehend, however, that unless the previous tendency of the film to contract on drying had been, in the first instance, to some extent counteracted by the gum, its subsequent ready permeability by water, and expansion, would only increase the tendency to leave the plate.

Since writing the above, we have had another communication from Major Russell, which will be found amongst our correspondence. His experience with gum, it would appear, does not bear out the opinion of the gentlemen to whom we have referred. We, of course, defer largely to the opinion of Major Russell, based as it is upon practice with his process, extending over a greater period of time than it has been used by any other person; extended experience in various hands, will be, however, necessary to decide the question absolutely.

Scientific Gossip.

The spectrum researches seem to be absorbing nearly all the attention of scientific circles. The more the subject is investigated the more powerful and searching a means of chemical analysis does it appear to be; a striking illustration of this has just come to our knowledge in the discovery by Mr. Crookes of a new elementary body by its means. A residue left behind in the purification of some selenium, being suspected, from its reactions, to contain a portion of the very rare element tellurium, was, after remaining unnoticed for ten years, lately submitted to chemical analysis, for the purpose of preparing the tellurium from it. The ordinary chemical tests were in vain tried upon it. *Something* was evidently there which possessed well marked reactions, but it was not tellurium or selenium; and as a last resource the method of spectrum analysis was used. A portion of the residue introduced into the gas flame of the apparatus gave abundant evidence of selenium, but as the alternate light and dark bands due to this element became fainter, and the observer was expecting the appearance of the somewhat similar but closer bands of tellurium, suddenly a *bright green line* flashed into view and quickly disappeared. An isolated green line in this portion of the spectrum was hitherto unknown. Mr. Crookes had become intimately acquainted with the appearance of most of the artificial spectra during eight or nine years investigation, and having never met with an appearance like this before, at once pronounced it to be due to a new element. Observing a line is one thing, isolating its cause is another. The apparatus used was capable of showing unmistakable lines when the producing element was not present in larger quantity than the millionth part of a grain; and the residue that showed this green line being itself difficult to be obtained, it became doubtful if ordinary test-tube chemistry would be capable of separating the interfering body from the mass of extraneous matter. Fortunately, however, our experimentalist met with more success than might have been anticipated. A certain quantity of the substance which caused the appearance of the green line has been really isolated and its properties examined, which leave no doubt that it is a real addition to the family of elementary bodies. In the purest state in which it has at present been obtained, it communicates as definite a reaction to the flame as soda. The smallest trace introduced into the burner of the spectrum apparatus giving rise to a brilliant green line perfectly sharp and well defined upon a black ground, and almost rivalling the sodium line in brilliancy. It is not, however, very lasting: owing to its volatility, which is almost at great as that of selenium, a portion introduced at once into a flame merely shows the line as a brilliant flash, remaining only a fraction of a second; but if it be introduced into the flame gradually, the line continues present for a much longer time. Several of its chemical reactions have been made out. These alone leave no doubt as to its being a new element, but in order to make assurance doubly sure, Mr. Crookes has subjected to rigorous scrutiny, in his spectrum apparatus, *every known element*, and has recorded that not one of them, although many give beautiful spectra, produces an isolated green line any where near the position of the new line. In fact there is not one element except sodium which gives a spectrum equalling it in simplicity. There still may be urged, against the supposition that this is a new element, the possibility of its being a compound of two or more known elements, or an allotropic condition of one of them; a moment's thought will, however, show that neither of these hypotheses are tenable. They would in reality prove what they are raised to oppose, for nothing less could follow than a veritable transmutation of one body into another, and a consequent annihilation of all the groundwork upon which modern science is based. If an element can be so changed as to have the spectrum of its incandescent vapour (which is *par excellence* an elementary property) altered to an appearance totally unlike that given by its former self, it must have been changed into something which it originally was not; and this, in the present position of science, is an absurdity.

In the annual exhibition of inventions just opened at the rooms of the Society of Arts there are one or two things exhibited of interest to photographers. The first is a stereotrope or stereoscopic thaumatrope, exhibited by W. T. Shaw. This instrument consists in the application of the principle of the stereoscope to that class of instruments variously termed thaumatropes, phenakistoscopes, phantoscopes, &c., which depend for their results on "persistence of vision." In these instruments, as is well known, an object represented on a revolving disc in the various positions it assumes in performing a given evolution is seen to execute the movement so delineated; in the stereoscope the effect of solidity is superadded, so that the object is perceived as if in motion, and with an appearance of relief as in nature. Pictures for this instrument may be varied infinitely, the only limit being the skill and ingenuity of the photographer; and it is peculiarly fitted for the representation of all kinds of machinery in motion.

A useful instrument, for the working photographer, is likewise exhibited by J. Moule. It is called the self-acting photographic washing apparatus and chemical filter, and is intended for washing photographic prints and collecting silver from the washings. It consists of a large upright box, the top of which is formed into a trough for washing the photographic prints in. From this trough the water charged with silver is allowed to overflow through a wastepipe into what the inventor terms a "float chamber," immediately beneath. When this chamber is filled to a certain height, the float begins to rise, and at the same time it lifts a valve attached to its upper surface, which when at rest accurately fits a conical hole in the bottom of the washing trough. This is in consequence emptied of its washings, which in the first place pass into the float chamber, and ultimately (by means of an aperture in its upper part and a syphon tube covered by the float) into a third chamber called the mixing chamber. As soon as a sufficient amount of liquid has accumulated in this third chamber to reach the top of a tube, which reaches nearly to its upper part, it passes down it into a fourth, the salting chamber, and is there saturated with common salt by means of crystals of that salt, which are placed in a perforated compartment at the upper part of the salting chamber. A little more accumulation of washings from the first and second chambers causes the liquid to rise to the level of the bend of a syphon in the mixing chamber, the action of this is thereby started, a flush takes place from the salting chamber, and a part of its contents returns charged with salt, and the whole is then carried over into a fifth chamber, called the precipitating chamber, by the action of the aforesaid syphon; here the chloride of silver formed settles to the bottom and accumulates, and the supernatant liquid is carried off after passing through a filter. This filter is formed of a perforated tube filled with cotton-wool and zinc-filings, so arranged that any particles of unprecipitated silver salts that may have escaped the first attack may be reduced by the zinc, and retained in the interstices of the wool. In this large precipitating chamber is fixed an air tube, which, however, may be connected with the developing sink, so that its drainings may be at once carried into the precipitating chamber. There is also a capped tube about one-fourth of the height of the chamber from the bottom, for drawing off the supernatant liquid, when it is wished to remove the precipitated chloride of silver through a stoppered aperture placed at the bottom of the chamber. All the parts exposed to the action of the solution, are constructed of a material that is impervious to water and the chemical action of acids, &c., and therefore not likely to readily get out of order. The frequency of the change of water in the washing trough is regulated for any given interval of time by the adjustment of the supply by means of a tap. The salting chamber once charged with a saturated solution of salt, and rock salt placed in the perforated compartment over it, is calculated to be sufficient to precipitate fifty ounces of silver, and beyond keeping this charged with salt, no other attention is requisite. The washing trough may be used as a sink where developings are carried on, by which a large amount of silver can be saved, which is at present lost.

POSITIVE PRINTING.

Mr. Maxwell Lyte has communicated to the *Moniteur de la Photographie* some practical remarks on positive printing on albumenized paper. Passing over the details of the method of albumenizing paper, which may be found in every treatise on photography, he proceeds to remark that it is a very great error to add acetic acid to the albumen, for, since the latter is alkaline, the addition of acetic acid produces an acetate, with the subsequent formation of acetate of silver in the nitrate bath. This salt being very unstable, the paper containing it turns rapidly brown when kept. The proportion of salt added to the albumen must not exceed two per cent. The operation of albumenizing the paper should be made in a dry place in dry weather, and the paper itself should be dried before being albumenized. The brilliancy of the proofs depends on this condition. The paper should be floated on the albumen not more than two minutes, for if it be allowed to remain longer, the albumen is apt to dry streaky, and will not have the fine texture desired. In fact, if the albumen does not dry quickly, but has time to penetrate the paper, the proofs will appear dull and faded. The best paper is that called *papier Saxe*, which is made in Germany; but some French papers are equal to it in quality, and are not so dear; the real *papier Saxe* costs 80 francs the ream, while the French is not more than half that price. The paper should be kept some time before being albumenized, by this precaution the metallic spots disappear by oxidation. After being albumenized it cannot be employed too soon, and it should be kept in a dry place. But in spite of every precaution, albumenized paper always becomes deteriorated in the course of six months. This arises from the salt in the albumen, which at first on the surface, afterwards sinks into the paper, so that the sensitive compound is formed in its tissue. When the paper is nitrated the result is, that after being printed, the image not being on the surface of the paper loses much of its brilliancy.

To sensitize the paper, dissolve five or six drachms of nitrate of silver in every thirty drachms of distilled water. Put the solution in a flat dish, and float the paper, carefully avoiding bubbles, for at least four minutes; it is then lifted and drained. The bath must be kept of uniform strength by the addition of a suitable quantity of a stronger solution of nitrate. After a certain time the bath becomes thick and coloured. Many methods have been proposed for remedying this inconvenience, such as coagulation by heat, which is not efficacious; or mixing with kaolin, and filtering, which is effectual, but expensive. The objection to the addition of citric acid is, that it renders the bath very acid, and that the paper sensitized upon it is very slow in receiving an impression, by the action of light, and also acquires a disagreeable red hue. The method proposed by Messrs. Davanne and Girard, which consists in adding a little of a solution of common salt to the discoloured nitrate bath, and afterwards filtering, is the best. Or the following modification may be tried:—Make a mixture of crystallized phosphate of soda 110 parts, with crystallized carbonate of soda 40 parts. Take of this compound, 70 parts, and dissolve it in 1000 parts of water. About 50 grains of this solution added to a pint of the bath is sufficient to deprive it of its dark colour, and render it neutral.

(*To be continued.*)

ON MANIPULATING WET COLLODION PLATES IN THE FIELD

BY VERNON HEATH.*

Let me in the first place explain the reason why I am induced to bring this subject before you. I have frequently noticed that, at meetings of various photographic societies, papers have been read on this subject, but I have always remarked that the operator merely described the manipulation of stereoscopic plates, or, at all events, of plates of small size: in several instances indeed, I have noticed that the size of the plate was not even mentioned. In fact, I have no hesitation in saying that, in nearly every case where papers have been read before societies upon manipulating in the field, either with the old or any of the new processes, the operator's experience was limited to small plates.

I recollect once reading a paper which had been produced before a provincial meeting, in which the author commenced by condemning every dark tent or box in use, and then explained a contrivance of his own which he carried in his coat pocket; but he nowhere described the size of the picture he worked; and it was only by observing that in one sentence he spoke of the stereoscopic effect of his pictures, and the angle at which they were taken, that I was able to determine the size of the negative he obtained. Now, I believe that the condemnation of tents and dark boxes by those whose operations are limited to small-size plates are as gratuitous as unnecessary, for it requires but the exercise of a very little ingenuity to work small plates without any such contrivance at all.

I once knew a zealous follower of the art who worked the collodion process thus:—He fitted his camera in his hat, punched out a piece of the front of the hat the size of the lens, which piece he refitted and attached a string to, and when working used it as the cap of his lens. In one breast pocket of his coat he had his bath, and in another his developing bath, fitted with yellow glass; and with such means he succeeded in obtaining pictures.

But the dark tent and chamber are, however, necessary for those who work plates of ordinary landscape size, and as I believe that the wet process is superior to any of the dry processes, where really artistic and truly satisfactory results are desired, I will now state my own experience and mode of manipulating that process, venturing to believe that it might be in some measure acceptable to the society if I described the exact means which enabled me to procure the negatives from which my pictures now in the Exhibitions are printed, and one of which this society has done me the honour to select as its presentation picture—the London Photographic Society having selected three for a similar purpose. I shall refer chiefly to my photographic visit to Endsleigh, the seat of his Grace the Duke of Bedford, in Devonshire.

Probably the points of peculiarity in my manipulation, and those most worthy of your attention, are—First, my method of working Smartt's tent; second, what would generally be considered the *over-exposure* of my negatives; third, my method of developing; and fourth, the deferring of fixing till the end of the day, or to some other convenient time.

First, then, as to the apparatus.—My negatives are all on 12 by 10 plates, and, with the exception of one (which was previously mentioned in this room, and which was taken with a Ross's 8½ by 6½ orthographic lens) were all taken with a Grubb's C lens—a lens which is intended to cover merely 10 by 8, and I think it will be allowed that the definition, even to the margin, is all that can be desired. At this point I may be permitted to observe that I believe the landscape lens *par excellence* is that known as the single lens; and that, for this purpose, it is superior to all the new lenses, whether orthoscopic, orthographic, or triplet. I do not mean, in speaking of Mr. Grubb's lens, to disparage the landscape lenses of Mr. Ross, Mr. Dallmeyer, or any other maker of eminence; I am merely mentioning the fact that my pictures were taken with a Grubb's lens, and that I think as highly of it as possible for landscape work. My camera is a folding one, and, although somewhat heavier, I consider it superior to that known as Captain Fowke's, or Mr. Kinnear's, inasmuch as it is firmer and more rigid. The tent which is before you is that known as Smartt's, and I must say that, for field work, I know nothing so efficient and convenient. I have arranged in it some special fittings and contrivances of my own, to which I will refer presently. I used Ponting's collodion only, and a bath made after his formula.

Now for the manipulation.—In the first place I am most scrupulously careful and particular in every portion of the process, and I think it impossible to photograph properly without being so. In cleaning my glasses, I use nothing but alcohol and tripoli, applied with a tuft of wool, and then thoroughly removed with a linen cloth. I then pour on a few drops of alcohol, which I rub off with a clean linen cloth, and finally polish with a leather. To one side I give a little more attention than to the other, and I stow the clean plates away in pairs, placing the two well-polished sides together.

Then as to the manipulation in the tent.—The general arrangements of Smartt's tent are now so well known that it is only necessary that I should point out the contrivances I have had fitted to it. For instance, a water bottle is hung over the table, which I can work with one hand, and the negative bath is suspended from the front of the table, as you see. Over one part of the table, and attached to the rods of the frame, I have contrived a shelf, where the *chassée* of the camera is placed; this, it will be seen, is a very useful contrivance. I coat my plate in the tent, after having first carefully closed the opening. When the plate has been in the bath the requisite time, I allow it to drain for a few seconds, and then remove it to another little ledge I have contrived, and allow the draining to complete: it is now ready for the *chassée*. I mention this with some minuteness, because I am quite sure that one of the most prolific sources of stains upon negatives is due to the plate not being sufficiently drained before it is placed in the *chassée*. I not only drain it thoroughly, but I put strips of blotting-paper along the top and bottom of the plate. The plate is now supposed to be in a proper state to go into the *chassée* of the camera.

With regard to the exposure in the camera, I believe that the most artistic effects are produced by what is termed *over-exposure*—a term which ought no longer to be allowed if its results are superior to those from negatives exposed a less time. Excepting, of course, burnt-up pictures, I do not think there is any such thing as *oxer-exposure* in landscape photography.

* Read at a meeting of the Blackheath Photographic Society, March 18, 1861.

It must not be supposed, however, that I mean by over-exposure exposing for a great length of time. The average exposure of my negatives, in varying but good light, was about thirty seconds, using a lens, it should be remembered, of fifteen-inches focal length. What is usually understood by the term *over-exposure*, the several negatives I now produce will illustrate. It will be perceived there is a want of that complete brilliancy which negatives, believed to have been exposed a proper time, generally exhibit. If they are viewed by transmitted light a slight redness will be perceived, and this is usually supposed to be a sign of *over-exposure*.

The effect which I believe is produced by what is erroneously called over-exposure, or at all events by negatives in the condition of these, is a greater gradation of tone and softness of effect, and the different planes of the subject are brought out in a much more beautiful manner. I think that when a negative appears very brilliant there is generally a flatness of effect. I lay some stress upon this point, as I really believe it to be important, and I think that if more attention is paid to it better and more artistic effects will be produced.

Now I believe that my method of development is peculiar —at all events I think that that distinctiveness of character which is stated to belong to my pictures is, in a great degree, due to the nature of the development. I prepare sufficient developer for a day's work, of the following proportions:—Eight grains pyrogallic acid, eight ounces of water, one drachm of glacial acetic acid, and one drachm of alcohol. This is about the strength that a pyrogallic developer is generally used; but though I thus prepare it, I do not use it of this strength. I have a bottle of distilled water in my tent, and into one of my developing cups I pour just sufficient to cover the plate, —say two ounces.

Being now ready to develope, I carefully close the tent, and, having previously placed the *chassée* on its ledge, I remove the plate with the pneumatic developing holder, and pour over it very carefully the measure of distilled water. I allow this to flow over and remain on the plate for a few seconds, and I thus take up a large portion of the free nitrate of silver. I then pour the water back into the developing cup, and add to it about a drachm of the pyrogallic solution, so that instead of commencing my development with a one-grain solution of pyrogallic, I have merely taken a drachm of a one-grain solution to two ounces of water. This is a very weak developer, and of course the action of development is much retarded—the picture coming out very faintly and gradually. It is, therefore, very manageable and pleasant, and in hot weather will be found most advantageous; and, what is of great importance, I obtain the details in the shadows to an extent I never succeed in getting with an active developer.

When I am satisfied with the amount and effect of details produced (the negative at this stage being faint, and of an intensely red colour), I slightly wash the plate and complete the development with the one-grain solution of pyrogallic, to which, if it becomes necessary, I add a few drops of silver, —but, if possible, it is better to do without the latter. I then wash sufficiently to remove the developer, and at once place the negative away in a box I have had made for the purpose, in which the grooves are of such a form that they cannot injure the edges. I put a pad of wet blotting paper at the top and another at the bottom of the box, and the negatives are thus kept sufficiently damp until the end of the day, or even until the next day, so that I am enabled, without risk, to fix them. I do not fix in the field unless circumstances compel me; and to those who use the wet process this is an immense advantage, as it saves time that is valuable, while the necessity of having a large supply of water is avoided.

I may mention that if, by any chance, the edges of the film are injured previous to fixing, so that there would be a risk of losing the film during the fixing and washing, I first of all dry the negative thoroughly, and then with a camel-hair brush and the ordinary spirit varnish, I paint round the edges and damaged places, and when dry and hard I float water upon the negative until the film is saturated. I then fix and wash in the ordinary manner. By adopting these means I have never lost a negative; but I very seldom have one damaged so as to render this treatment necessary.

To complete my remarks upon the use of the tent, I ought to explain that there are cords furnished with it, which, whether there is wind or not, I always make a practice of securing the tent with previous to using it. No doubt a high wind would blow it over but for these cords; it is, however, secure enough with them, and as the cords are sold with, and are therefore a portion of the tent, I should just as soon think of putting up the tent without the cover as without them.

The actual chemicals and other things required for use in the tent are contained in a field-box of a very convenient and portable form; and, as I always place it in exactly the same position underneath the table of the tent, I am able to find whatever I want without any difficulty. In my field-box I carry a spirit lamp, which I find very useful for drying plates from condensed vapour, which forms upon them during such a season as that of last year.

I have now said all that I at present desire to state upon this subject; and I shall feel obliged if you, sir, or any member of the society, will make any observations you think fit upon the remarks I have made. I may say that I have a passion for the art, and that whatever falls in my way calculated to forward it, I feel the greatest pleasure and gratification in communicating.

In conclusion, let me say that, if everybody would try to find out how little could be done with it in the field, there would not be the objections against the wet process we hear of at present. I think that those who prepare plates for any of the preservative processes really in the end take a great deal more trouble than is required for the wet process; there is the ordinary preparation of the plates in the first instance, the washings afterwards, then the application of the preservative, and at last the chance that the plates may not turn out good, for a very large per centage certainly do not.

[During the course of his remarks, Mr. Heath produced a great number of illustrative negatives and prints. He also put up his dark tent, and exhibited the various ingenious contrivances he referred to.]

THE RESIN PROCESS.

BY J. GLOVER.*

The ground on which I propose to take my stand is, first of all, to demonstrate as briefly as possible its *simplicity*, and then to meet the charges which have from time to time appeared against the "resin," or more appropriately the "Despratz" process.

In urging the first point for consideration, allow me to ask what formula can entail less complexity than one in which the sensitive surface requires *no application of a preservative*, but simply washing with an indefinite quantity of spring water—that succeeds with an acid silver bath—and that developes with all the rapidity of moist plates? How many photographers, worthy of the name, are there who, after arriving at excellence little short of perfection in wet collodion, shrink from the difficulties which have hitherto attended the manipulation of dry plates, and who, from motives not altogether pecuniary, refused to adopt those prepared by the agency of others? Such individuals would hail with the highest degree of satisfaction a dry process combining simplicity with a tolerable degree of sensitiveness. The writer affirms—and it is the experience of every one who has followed out the process under consideration—that no other one approaches so nearly to the manipulation of wet collodion; for, I ask, in what does the difference consist but in copious washing and the usual precautions in drying?

* Read at a meeting of the North London Photographic Association, March 27, 1861.

I can state with the greatest assurance that any good negative operator can produce, with suitable materials, a seccessful dry resin plate. So much for simplicity.

The *objections*, real and imaginary, which have been urged against the process, I have no doubt, have deterred many from giving it a fair trial. They are, however, happily overcome without difficulty. The foremost—and which, if well founded, would have proved altogether fatal to its adoption, and stamped it as unsound in principle—is the alleged deterioration of the bath from the introduction of such a carbonaceous substance as resin. This, however, as far as I can learn, was only hinted at theoretically. Far from being sound doctrine, I find practically that, in the homœopathic doses which are recommended, it is perfectly inert as regards any action upon the silver solution. After using a bath for a whole season, the plates last immersed in it were, if anything, more sensitive than those prepared at the commencement, and without any of the effects attendant upon an excess of organic matter in the solution. This is not alone my individual experience: it is borne out by several of my friends. It rests with those interested in the chemistry of our art to determine what is the effect upon the film itself. Irrespective of the mechanical action, I would suggest—Is there not some chemical change—viz., the precipitation of *pinate of silver*—which partially accounts for the preservation of the collodion in the sensitive state, as well as the amount of that sensitiveness?

The next two, and by far the most general, objections, are the *liability* of *the film to become detached from the glass* during developement or subsequent washing, and the *existence* of *small circular insensitive spots* which remain transparent after prolonged action of the developer.

If a suitable collodion, with the minimum quantity of resin (say a quarter of a grain to the ounce) be employed, these defects are entirely obviated. Supposing a sample of collodion, suitable in every other respect, should show a tendency to leave the plate, if, prior to moistening, a camel-hair pencil dipped in benzole varnish, be passed round the edge, an otherwise tender film will remain intact. The collodion I recommend is one composed of about two-thirds cotton and one-third paper pyroxyline (both produced from acids at medium temperatures), iodised with cadmium salts, used as soon as in good working order for wet plates, and that does not give, under such circumstances, an intense image. It should stand two or three days after the addition of the resin, and be decanted for use. Such a collodion, sensitised in a forty-grain silver bath, containing from three to four minims of glacial acetic acid to the ounce, will endure the thorough washing it is then to undergo—remembering it is the last traces of free nitrate that retard the sensitiveness of dry plates. I recommend *spring* water, so as to ensure, by chemical agency, this desideratum, and is much safer than adding a chloride to pure water, it only remains to dry spontaneously, carefully excluding dust, without confining in a moist atmosphere.

The third difficulty is the *splitting up of the film*, on drying the finished negative. The cause is obvious—the employment of too contractile a collodion; nevertheless, should it prove otherwise suitable, a certain remedy has been suggested by my worthy friend Mr. Corey, and consists in flooding the plate with dilute albumen previous to the final drying.

The fourth and final difficulty with which we have to contend is *want of density*. This is not so much a characteristic of the process, but, as previously stated, the kind of collodion most suitable is prone to this defect (if such a term is rightly applied); for I find no difficulty in obtaining the necessary amount of intensity, with absence of hardness, by using a strong developer—never less than three grains of pyrogallic acid to the ounce of water.

I would urge at this point the question—Is not this seeming drawback rather to be viewed in the light of an acquisition? In most dry processes we have complaints of the opposite tendency, so much so, indeed, that it has been a by-word among the votaries of the wet process, who, on criticising one of those pictures displaying stronger contrasts than ever existed in nature, naturally exclaim—"Surely this is from a dry plate! is it 'gelatine' or 'oxymel?'"

Having thus hastily glanced at the difficulties, allow me, in conclusion, to give my experience as to the comparative sensibility of the various dry processes, to which I have given a fair trial.

Taking "Resin" as the standard, which I find to be the most sensitive of any by a published formula	1
"Fothergill," with chlorided albumen ...	$1\frac{1}{2}$
Do. original formula	2
"McNair"	2
"Oxymel," on unwashed collodion	3
"Gelatine" (Patent Dry Plate Co.)... ...	4

The above were all treated the same as regards their developement.

THE PANORAMIC LENS.

BY PROFESSOR DELAMOTTE.

An interesting letter on the subject of the panoramic lens and its capabilities has been addressed by Professor Delamotte to the *Journal of the Society*. As his judgment as an artist and practical photographer of known ability possesses weight, we make the following extract from his letter:—

There are three points on which a practical photographer must convince himself respecting the lens. The first is to ascertain whether the lens gives uniformly good definition at the sides as well as the centre of the picture. The second, to ascertain whether it works free from flare and fog, and with equality of illumination. The third, to ascertain how much angle the cylindrical picture will include vertically, as well as horizontally.

On these three points I will simply state my conviction, founded upon what I have actually seen. As regards definition, I am not one of those, as you well know, who think there is anything charming or artistic in bad focus. I think it has been fully proved by photography that the finest possible definition, or focus, is compatible with the highest artistic excellence; and I hold, moreover, that a lens which does not give good focus will not do, and is to be condemned. But I am satisfied with the panoramic lens on the score of good definition.

In one of the negatives, the central definition is equal to anything I have ever seen; and, in another, good average definition is extended over the whole picture. The lenses with which these pictures were taken have not been made of the best glass, or with suitable mechanical appliances, and yet the results are already good enough to satisfy one, even if nothing better should be obtained when the apparatus is more accurately made.

As regards fog and flare;—The common lenses are sheltered by a tube or hood, but the panoramic lens projects beyond the mounting. Is this likely to fog the picture? The question can easily be answered by an appeal to experiment. All Mr. Sutton's panoramic negatives, that I have seen, are clean and dense, like any other good negatives, and exhibit no indications of fog or dark spots, or inequality of illumination. They have been fully exposed, and in one case with the shadows thrown *towards* the lens, and yet they are as perfectly free from fog as any other good negatives. This settles the question of fog.

The angle included in the vertical direction seems to be about the same as with the ordinary lenses. The foregrounds are in every case perfectly in focus, to a *great* depth below the horizontal line.

The negatives to which I allude have been taken with a panoramic lens $6\frac{1}{2}$ in. focus, measured from the centre, and $\frac{1}{4}$ in. stop; and Mr. Sutton informs me that the exposure was generally about a minute, in good diffused light. With a common view-lens of the same focus and stop, the exposure was rather longer. The reason is, that the panoramic lens admits a much larger pencil upon the front glass than is determined by the size of the stop.

As an artist, I assure you I feel the greatest interest in the new lens. I am enthusiastic about it, and expect great things from it. It seems to me to be exactly what was wanted. When I go out to make sketches, I find, as a rule, that my sketch includes nearly twice as much subject as a common camera will take in; and nothing has been so mystifying to me, in my photographic practice out-of-doors, as to be unable to include all that I require upon the ground glass. This circumstance has greatly damped my ardour in photographic view-taking; but Mr. Sutton's new lens gives me all that I wanted, and opens a new field to me. I wish I could make your readers feel this. The panoramic lens is really and truly what photographic *artists* most want. I consider it a grand invention. One is not obliged to take panoramic pictures with it on *all* occasions; one may be content, perhaps in the majority of cases with 60° or 70°; but to remain content with the 30° or 40° which the common lenses give is to me impossible.

Mr. Ross speaks with confidence, and I believe I may say with enthusiasm, of what he expects this new lens to accomplish. He is arranging costly mechanical appliances for its especial manufacture; and before many weeks I hope to be able to inform you that I have actually tried one of these lenses made by him, and produce satisfactory results with it.

Proceedings of Societies.

North London Photographic Association.

The annual meeting of this Association was held on the evening of Wednesday, the 27th ult. Mr. G. Shadbolt in the chair.

After the minutes of the preceding meeting had been read,

The Chairman read a letter from Mr. John Cramb, of Glasgow, relating to his articles on the hydrometer bath tester.

"67, *West Nile Street, Glasgow, March* 23, 1861.

"Dear Sir,—I am anxious to offer a few words of explanation through you to the members of the North London Photographic Association, regarding the hydrometer silver meter question. It would be difficult for me to risk entering at any length on that subject, without endangering further my own peace of mind and that of those for whom I entertain the highest respect, notwithstanding that we have taken a different view of a matter which has, no doubt, two sides. I merely wish in this note to disclaim distinctly any *intention* to give offence, or any *expectation* that anything I was doing was calculated to do so; and I feel no difficulty in expressing the most sincere regret that anything I have written should have had an effect I never contemplated.

"On the treatment I have received I make no further remark than that I leave it to the gentlemen who have animadverted on *me* and my conduct to do as to them seems just and honourable.

"My views on the merits—as a lawyer would phrase it—are unchanged.

"You will perhaps be kind enough to read this at your first meeting. By so doing, you will oblige your most obedient and humble servant, John Cramb."

"J. Barnett, Esq., Hon.-Sec.,
"North London Photographic Association."

The Chairman remarked that, after a person who had done wrong had expressed his regret, nothing more remained but to let the matter drop.

The Chairman then read a paper, entitled, "A Plea for the Resin Process," by Mr. J. Glover, of Liverpool. Some extracts will be found in another page. A series of negatives illustrative of various points in connection with the process were exhibited; the chief defect illustrated was the spottiness and tenderness of film incident upon the addition of too much resin.

Mr. Dawson remarked that the negatives generally seemed a little hard from under-exposure.

Mr. G. Wharton Simpson said he had some years ago, in the course of some experiments on the action of kinds of organic matter in collodion, added Canada balsam and Venice turpentine in various proportions. His experiments were confined to the wet process, but he had not observed any of the disadvantages sometimes attributed to the use of resin. With the addition of various proportions up to about two grains per ounce, he had not observed any difference beyond the film adhering to the glass with a little more tenacity. About two grains per ounce and upwards began to cause spots, which seemed the nuclei of more intense reduction of silver.

Mr. Hill said the chief danger he should have apprehended was injury to the nitrate bath.

Mr. Simpson said he had excited some scores of plates in the nitrate bath he was regularly working, and had never perceived the slightest injurious result.

The Chairman.—When the Despratz process was first published he had tried the addition of chloroform varnish to collodion; but the results were unsatisfactory, and the film was made very pulverulent and rotten. As analogous in character he had also tried the addition of camphor, but the result was still unsatisfactory.

Mr. Hill had tried the use of amber varnish; and had not found any bad results, but he had not carried his experiments to any length.

Mr. Simpson had tried the use of camphor. It had the effect of making the film powdery, and caused an opaque bloom on the shadows.

The Chairman then read a communication from Dr. Maddox, on a curious effect in developing a wet collodion plate, in which the image appeared partly negative and partly a transmitted positive.

A conversation on the subject followed, in which Messrs. Dawson, Hill, Moens, Simpson, Foxlee, the Chairman, and others, took part. It was stated that the circumstance was not an uncommon one, and might be produced by a variety of causes, such as a splash of hypo getting mixed with the developer, the action of light whilst developing, prolonged development with iron followed by pyrogallic acid, especially when the bath was old, and other causes.

Mr. George Dawson then read an interesting paper in continuation of his analytical experiments on silver baths, in which he had had an opportunity of examining some of the silver baths which had been tested in Glasgow. In regard to two of these he discovered some very remarkable facts, one contained a quantity of nitrate of potash altogether inexplicable, except on the hypothesis of the action addition of that salt, and another labelled an "old collodion bath" which had no trace whatever of ever having been used for such a purpose. The paper is too important and interesting in its entirety to admit of condensation or abstract, we hope, therefore, to give it at length in an early number.

The annual report and balance-sheet were then read, from which it appeared that the Society was prospering, and had a balance in hand of £11 10s. 6d.

Mr. Dawson moved and Mr. Simpson seconded the adoption of the report, which was carried.

The President, Vice-President, Treasurer and Secretary were then, on the motion of Mr. Dawson, re-elected.

On the motion of Mr. Hughes, the rule enacting that the committee consist of six members was modified, to make the committee consist of eight members.

The following gentlemen were then elected as members of the committe for the ensuing year:—Messrs. T. A. Barber, F. Bedford, G. Dawson, C. Jabez Hughes, G. R. Mainwaring, C. J. Moens, W. Shave, and G. Wharton Simpson.

In the course of the evening the following gentlemen were elected members of the society:—Messrs. H. Morton, S. Evershed, J. M. Mackie, John Louch, S. Mason, A. H. Bateman, R. Gordon, R. Ramsay, Bradshaw, Gillivray, Joyce, B. Smith, Dickinson, Denison.

The usual votes of thanks terminated the proceedings.

Blackheath Photographic Society.

The ordinary meeting of this Society was held on Monday, the 18th inst., at the Golf Club House, Blackheath. Charles Heisch, F.C.S., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman then called on Mr. Vernon Heath to read a paper on "Manipulating Wet Collodion in the Field."

In the course of his paper Mr. Heath exhibited his tent and the various contrivances he had employed to facilitate manipulation.

The Chairman then said he felt sure all present must feel much indebted to Mr. Heath for his paper—many points in it were most valuable. He could himself vouch for the benefit of a weak developer, which he always employed, more especially for dry plates, though he had never carried it to the extent recommended by Mr. Heath for wet ones. He had no doubt the plan of pouring water over the plate before development would also prove valuable as equalizing the action of the developer. One statement of Mr. Heath's surprised him not a little, this was that it was possible to dry the plates before fixing, even after varnishing the edges—he should have expected to see the film crack all over.

Mr. Heath said if all the injured parts of the film were varnished so as to prevent the fixing liquid getting under it, he had never found it crack.

The Chairman said much would depend on the quality of the collodion, if it were contractile it would of course be much more liable to crack. Some very good collodions were apt to crack at the edges of the plate even in the process of drying.

Mr. Heath said this might generally be prevented by completely freeing the film from the ground edges of the plate as soon as the film got sufficiently dry by wiping round the edge with a damp cloth, which permitted it to contract evenly. This plan had also the advantage of making the plates look very neat.

The Chairman said Mr. Spiller had mentioned to him that he had some unvarnished plates, the film on which, after keeping some months, had suddenly cracked all to pieces and come off the plate.

Mr. Heath said he had seen some which had cracked after varnishing, but never before; none of his own plates had ever cracked, varnished or unvarnished.

In answer to a question by Mr. Glaisher—

Mr. Heath said all the negatives he had taken in the field were fixed with hyposulphite of soda, but he had lately tried fixing with cyanide of potassium on some plates developed with iron, which had answered very well.

The Chairman said he thought plates developed with iron stood the action of cyanide of potassium better than those developed with pyrogallic acid, the latter being apt to lose some of the delicate half tone.

Mr. Heath then said he had been experimenting lately in portraiture with various collodions, and had found a collodion made by Mr. Thomas, and iodized with magnesium, give peculiarly beautiful half tones, which he had not seen with other collodions.

The Chairman said he believed this was due much more to the fact that the collodion in question contained a large amount of bromide, than to the fact of its being iodized with magnesia salt. He would ask Mr. Heath if he found collodion, iodized with magnesium, kept as well as had been stated by some people.

Mr. Heath said it kept pretty well, but not like that iodized with cadmium. It lost sensibility after five or six weeks. All the pictures he had produced were taken on collodion iodized only a day or two.

The Chairman said he had tried magnesia salt, but did not find the collodion keep better than any other containing the same quantity of bromide. Even when iodized with ammonia salt, collodion would keep well for two months if it contained a good quantity of bromide.

Mr. Heath presented the society with a portrait of the President, taken on the collodion he had mentioned.

Mr. Glaisher proposed and Mr. Hardy seconded a vote of thanks to Mr. Heath, for his paper and the portrait, which was carried unanimously; and the meeting adjourned.

London Photographic Society.

The usual monthly meeting was held on Tuesday evening, the 2nd instant. P. Le Neve Foster in the chair.

After the minutes of the previous meeting had been read by the Secretary,

The Chairman announced, that M. Claudet had been elected a member of the council, in the place of Mr. Walter Hawkins, who had declined to act in the council after his election at a recent meeting.

The Secretary then read a communication on "Halation, its true cause and remedy," by Mr. Marlow. The object of the writer was to show that the phenomenon, usually known as halation, was the result of the action of light which, having passed through the excited collodion film, was reflected back, and produced the effect referred to. The remedy suggested was the blacking of the back of the plate with black varnish. The paper was illustrated with several specimens to prove the position, the majority of which, however, it appeared, had not been exposed in the camera, but to diffused daylight, the image being formed by partly covering the plate with a piece of black card.

Mr. Shadbolt said there was an old joke to the effect that when the French academy were forming their dictionary, a celebrated naturalist entered one day, and was informed by the assembled *savans* that they had just been defining a crab, and wanted his judgment. They had defined it as "a red fish, which walks backward." "Excellent!" exclaimed the naturalist, "only it is not red, it is not a fish, and it does not walk backward!" The paper they had listened to was an explanation of the cause of a certain fogging by reflection, but certainly did not touch the question of the phenomenon known as halation. That which was known as halation was an increased reduction, which generally took place where very light and very dark parts of an image were in immediate contact, and the greater part of the increased deposit was on the lighter part. It had no distinct outline as these specimens had, but gradually diminished. Even had these results been true cases of halation, there were objections to the theory. For instance, it was well known that light passed through a film of excited iodized collodion with the greatest difficulty.

The Chairman asked how it was, if Mr. Marlow's theory was correct, that halation did not always occur.

Mr. Shadbolt said he did not see how they could with propriety enter into the subject of halation, since it was not really before the meeting, but something else assuming that name. He might remark, however, that halation rarely occurred except when the sun was near the horizon, and the presence of a large amount of organic matter in the bath was a favourable condition.

Dr. Diamond remarked that he remembered on one occasion where the yellow glass of an Archer's camera was accidentally broken, and two coated and excited collodion plates served perfectly well as a temporary substitute, effectually keeping out the light. This confirmed Mr. Shadbolt's view that light would not readily pass through the excited collodion film.

A conversation on the subject then ensued, in which Mr. Malone, Mr. Shadbolt, Dr. Diamond, Mr. Eliot, and others took part, in which it was manifest that much difference of opinion existed as to what halation really was, whilst nothing tending to elucidate the cause or remedy transpired.

Mr. F. G. Eliot then showed a tent and travelling equipment, for working in the field. The chief peculiarity consisted in making the box in which the apparatus was carried form the base of the tent, four upright pieces of wood being placed in grooves in the corners of the box, supporting top cross-pieces over which the canvas was fitted. A large plate-box served as a seat for the operator.

After some conversation on the subject, the proceedings terminated.

Photographic Notes and Queries.

Megascopic Enlarging Camera.

Sir,—Having lately purchased a Megascopic camera (manufactured by Seeley and Garbanatti, New York) for printing enlarged proofs from negatives, will some of your numerous readers, having the same, kindly inform me of a good method of working, as my prints seem to lack sharpness? There are several photographers who have them, and I have seen some good work done with them. They are about one quarter the price of Woodward's solar camera, and, if they can be worked successfully, must be appreciated.—I remain, yours respectfully,

A. B. S.

[Seeley's Megascopic camera is considered, we believe, by Mr. Woodward, as an inefficient imitation of the solar camera; but as we are not aware exactly of the points in which it differs, we can offer no opinion. Our correspondent's request is somewhat indefinite; he neither describes the camera, nor names the points wherein he needs advice.—Ed.]

Substitute for Yellow Glass.

Dear Sir,—I saw in a number of the Photographic News, a few weeks since, a letter respecting the inferior quality of much of the yellow glass used for admitting light into developing rooms. I am now working in a room in which I have a frame five feet by seven feet covered with yellow demy paper, which can be obtained at any stationer's at one penny per sheet. The frame has now been covered more than three years, and I find it quite as good now as the first day on which it was fixed. I can produce pictures in the room covered with the paper above alluded to, either negative or positive, quite brilliant, and without the least signs of fog. The paper should be thick demy. If you think the above will be of any use to your readers, I should be glad if you would be kind enough to give it a place in the next number of the NEWS; and oblige, yours truly, T. S. SWATRIDGE.

Yeovil, March 26, 1861.

COLLODION FORMULÆ.

SIR,—To most amateur photographers, who, like myself. purchase their collodions, it would be a great advantage if the makers, on each sample they sell, stated its exact constituent parts, and also that of the iodizer. I can fancy that somo might object to do so, having, as they imagine, surpassed their brother chemists in their own productions; in such cases we would not desire more than that the collodions be called by their own names; still when we read in your excellent paper of Mr. Blanchard producing *first rate instantaneous pictures* with a bromo-iodized collodion, the formula for which he most kindly gives us, in your last impression, one is anxious to see some respectable house advertising, and guaranteeing to supply such a collodion. The same remarks would apply to the alcoholic one used by Dr. Sanders for his dry plates, without preservative solution, as given in your NEWS ALMANAC. Unless we can obtain such samples of collodion ready made, I suppose there is no other way for it but to prepare our own, for however good may be our productions, we work so much in the dark that we can never be certain of obtaining the samo results when using another sample of collodion even from the same maker. The stereograms of which you made so very favourable and complimentary notice in your paper of the 28th ult. were taken with Mawson's collodion, wet plates, 30 seconds exposure, Ross's lenses, $\frac{1}{4}$ stop. The sensitizing bath I made during the severe frost, and in order to secure pure water melted a quantity of ice, and then passed the liquid through filtering paper. I am persuaded that half the troubles and difficulties amateur photographers complain of and meet with, would be avoided by employing *pure water for making their sensitizing bath.* Ice may be met with all the year round at the stalls of fishmongers, and the cost of it would be far more than compensated for by the satisfactory results obtained.—I am sir, yours, &c. C. F. B.

Langrigg Hall, Cumberland, April 2, 1861.

[Mr. Blanchard manufactures the collodion he described for sale.—ED.]

PORTABLE BACKGROUND.

SIR,—In answer to your correspondent W. H. H., I would say, procure some half-inch deal, about two inches in width, and make four frames three feet square outside measure, hinge two together with two small hinges, which we will say is the bottom half of the background, the other two, hinged together in the same manner, will be the top half, now these two halves to be bolted together with wooden plugs.

Get four yards of green baize cut in two, sew the two pieces together, press the seam, which is now to be what the tailors' call "wranted," I think it is drawing the nap of the baizo over the seam with green cotton, so that it does not show in the picture. This is to be stretched on frame.

The hood at the top for this blue lining will do supported on top of frame by slight deal oblique stays. which have shoulders that fit into corresponding holes in background frame, and into each other.

When taken apart, and the two halves strapped together, this background frame will of course be three feet square, and easily caried under the arm.

	s.	d.
Cost of frame	3	0
,, baize	6	0
,, blue lining	0	9
Total ...	9	9

N. W.

SIR,—Your correspondent W. H. H. may make a background that may be rolled on a roller easily, and unrolled without creasing, thus:—Stretch a piece of calico sheeting,* seven feet long, on a frame, or tack it against a wall, then size it over with thin glue size, when quite dry paint it with soap flatting made as follows:—Have some lamp black, white lead, and venetian red, ground up in as *little oil* as possible, mix this with turpentine till it is a dark mouse colour, then shave one ounce of common yellow soap into six ounces of boiling water, stir it till dissolved, then add it boiling to one and a half pound of the paint, mix it quickly, and when cold paint over the calico, and, if necessary, give it another coat when the first is dry. When dry the background can be rolled or folded without creasing.—Yours truly,

Heathfield Street, Swansea. THOMAS GULLIVER.

[We are glad to see Mr. Gulliver's name again; his suggestions are always practical and ingenious.—ED.]

* It can be bought two yards wide.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 3rd April, 1861.

As sunshine has been so very scarce during the past year or two, photographers would gladly avail themselves of the electric light as a substitute if it were not so dear. It answers their purpose so admirably that it is most devoutly to be hoped that it may become cheaper, it would then be to the photographer what steam has proved to the mariner, who now has no longer to wait for wind or tide. What a luxury it would be to be able to turn on a miniature sun on a cloudy or foggy day, or at night, to meet the exigencies of portrait or proof.

Some of our photographers, however, to whom money is luckily no object, make very frequent use of the electric light, especially with the so-called solar camera. The method now generally adopted in employing this instrument, is not to place a sensitive paper in the camera, but to obtain an amplified negative from the small positive, and print from that in the ordinary manner. By adopting this method we may obtain as many positive proofs as desired, instead of one at a time by the slow exposure in the camera. In the one case, about three quarters of an hour is required, even in fair weather; in the latter an impression is secured in about a minute. Besides, in the camera process, the sun moves during the prolonged exposure, by which the image becomes displaced, and the sharpness of the picture would be destroyed, were not the operator to kep the apparatus in motion to obviate the consequences of the sun's apparent motion. But this mode of proceeding soon becomes intolerable, even to the most patient of adepts. Now the employment of the electric light obviates, in great measure, these inconveniences. In the hands of the eminent optician, M. Duboseq, who recently experimented before our photographic society, perfect success is attained. In his arrangement, he places behind the collecting lens, in an ordinary amplifying apparatus, a voltaic arc formed of a powerful pile consisting of forty or fifty of Bunsen's elements, so as to substitute for the solar image, usually projected upon the mirror, a fixed electric light, always maintained in one position by a regulator, thus leaving the operator at liberty to engage in other manipulations. By the aid of this light an enlarged negative may be obtained in the course of a minute upon iodized paper.

I am gratified in being able to supply you with more ample details of M. Fargier's carbon-printing process, in which you have expressed so much interest. Up to the moment when the plate is impressed by the action of light, his process is identical with Mr. Pouncey's, or, what is the same, with Mr. Poitevin's; but beyond that point no similarity exists. He takes pure white gelatine, as free from alum as possible, and dissolves about two drachms in a pint of water; to this solution he adds a drop or two of ammonia to precipitate any alum that may be present, and then incorporates fifteen grains of the purest carbon intimately with the liquid; the best carbon is that obtained from the combustion of coal-gas. To effect the complete incorporation of the carbon with the solution of gelatine, the mixture should be well worked under the pestle in a glass or porcelain mortar, adding also fifteen grains of bichromate of potassa, previously dissolved in the smallest possible quantity of water. A portion of this mixture is poured on a piece of plate-glass, and dried at a gentle temperature, not exceeding 140° F. This done, the plate is placed under a negative and exposed to light for one or more minutes, according to the intensity of the light. Thus far, you will perceive, M. Fargier's process presents no novelty; but thenceforward it differs very materially from other known processes. In the latter, when the plate is conveyed to the dark-room, it is washed with water, to remove such portions of the gelatine as have not been acted upon by the light, leaving the insoluble portions which form the picture by the carbon they retain. But M. Fargier does not proceed in this fashion; for experience has shown him that this rough mode of washing removes all the half tones, and leaves only the opaque blacks, in consequence of the solution of those portions of the gelatine contiguous to the slightly coloured portions of the image.

To avoid this inconvenience, M. Fargier has overcome the difficulties in a very ingenious manner. Instead of washing the upper surface of the gelatine, that which has received the luminous action in a direct manner, he places it on a suitable support, aud then washes the lower surface of the film, so that only such portions as are really soluble are removed, leaving upon the support the most delicate half tones and the finest details. To accomplish this result, he proceeds as follows:—When the plate is taken from the printing frame into the dark room, he pours all over the gelatine surface a layer of thick non-iodized collodion: when this has become dry, he places the plate in a dish of water, collodion uppermost. The water penetrates beneath the collodion, and softens the gelatine, which soon becomes completely detached from the plate, and floats in the water: the glass is then removed, and the washing cautiously continued. When this is concluded (it must be performed in a dish with a white bottom, and perfectly flat), a sheet of gelatinized paper is dexterously applied to that surface of the gelatine which was originally in contact with the surface of the glass. It adheres with the greatest facility to the paper, and presents, when dried, a perfect picture with all the charms of nature's chiaroscuro. In dexterous hands very beautiful results may be obtained.

Among the mauy useful applications of glass, one recently made by M. Hubert, of Belgium, is worthy of mention. With this substance he constructs casks of various dimensions, from one gallon upwards. These possess many unquestionable advantages over wooden casks; in the first place, they are stronger, being found to resist a greater hydrostatic pressure without breaking. Next, they are admirably adapted for the preservation of fermented and spiritnous liquids, essential oils, chemicals, &c., as there is no chemical action on the glass, no loss by permeation or evaporation. The glass casks are fitted with ground-glass stoppers, and with glass taps. These do not allow of the contents becoming musty, as with wood; and being transparent, the quantity of liquid contained in them can at all times be readily ascertained. For convenience of handling, a wicker open framework is fitted to them. There can be no doubt that, when their merits are recognised, they will come into general use for many purposes.

M. Chevreul has presented to the Academy the eleventh report on his researches into the chemistry of dyeing. It consists of two parts:—1st. New proofs in support of the opinion maintained by M. Chevreul in opposition to many modern chemists, that the phenomena of dyeing are the result, not only of physical adherence, but also of a true chemical affinity. 2nd. Of the influence of heat, light, steam, and of the mordant in the process of dyeing.

M. Chevreul has now summed up the facts relative to the interference of chemical affinity, by announcing the results of four great series of experiments in dyeing made with picric acid, carthamine, sulpho-indigotic acid, and fuchsine-rose, upon silk, wool, and cotton. These three fabrics are very differently influenced by the above four tinctorial matters; sometimes one, and sometimes another, takes either a deep tone of colour or no colour at all. To M. Chevreul it seems impossible not to admit that these differences are evidence of a true chemical affinity. At the beginning of his communication, the learned professor emphatically declared that without the *cumul* (plurality of offices)—he has underlined and strongly accented this word —without his twofold functions of Professor in the Museum of Natural History, and at the Imperial Gobelins Manufactory, it would have been absolutely impossible for him to have brought his classification of colours, and his chemical researches upon dyeing to a conclusion. It was only at the *Jardin des Plantes* that he could command complete collections of colours from the three kingdoms of nature, where the zealous director of the School of Botany presented to his examination no less than 15,000 hues of leaves and flowers of all countries. It was only at the Gobelins that he could have made the requisite experiments in dyeing, and compose, define, and classify the coloured circles and scales; or could have met with so competent a judge with respect to colouring as the present director of that establishment, M. Perrin. These researches of M. Chevreul are of a nature that would hardly repay the outlay of publication, from the great cost of the illustrations, but owing to the liberality of the *Académie des Sciences*, they will not be lost to the world, as they will form the 33rd volume of its *Mémoires*.

The employment of electricity as a motive power depends on its relative economy with steam, or the difference between the cost of zinc and coal; for in the electric battery it is the zinc that is consumed, and is at present the most economical combustible for the purpose. Yet it is 105 times dearer than coal. Then to the cost of the zinc must be added that of the acids, making, for the same equivalent of power, zinc 200 times more costly than that of coal; or rather, the cost of electromotive power so much dearer than that of steam power. But a remarkable feature in the question is, that while ordinary steam-engines render only 0·052 of chemical power, the electromotive machine yields 0·20 to 0·25, which is enormous, and gives it an undoubted superiority over steam. Yet even at this rate, electromotive power is twenty times dearer than that of steam. The question to be solved therefore, is, the economic production of electricity.'

THE SOCIETY OF SCOTLAND.

Dear Sir,—At the last meeting of the Photographic Society of Scotland, and after the reading of Mr. Wall's paper, Mr. George Harvey, R.S.A., although thinking this communication "a step in the right direction," asserted that "his friend, Mr. Kenneth Macleay, who was a photographer as well as an artist, had informed him that in painting a photograph he always found it necessary to make the eyes somewhat larger than they were represented in the photograph, and it was notorious that the hands, which were usually a little nearer the camera than the face, were rendered disproportionately large." T. B. Johnson, Esq., who then occupied the chair, said that Sir David Brewstsr had proposed a remedy for "*such defects*."

In the name of common sense for what defects? Has Mr. George Harvey ever studied anatomy? or those proportions which derived from the most beautiful and perfect examples of ancient art, constitute rules of acknowledged value for drawing the human figure? Du Piles, quoting Fresnoy, *who derived* the measurements from the never yet surpassed or equalled statues of the ancients, tells us that—"*The hand is the length of the face;*" and Sir Joshua Reynolds, quoting Du Piles gives this and other laws as matters, not of dispute, but of recognized fact.

In nature we find faces unusually long or hands unusually short, but in a well proportioned hand and face Fresnoy's measurement has always been fouud by artists who sought truth the common and correct one. Apply this rule to any photograph of a well proportioned hand and face, and you have at once a demonstration of the fact. With due deference to Mr. Kenneth Macleay—I think the eyes are no more disproportionate than the hands, for although large eyes are unquestionably more beautiful than small eyes, small eyes are far more common than large eyes; and such conventional and hugely disproportionate eyes as our old fashioned miniature painters delighted in rendering are about the most uncommon things in nature.

I think it a great pity that some member of the Society of Scotland did not have a copy of your excellent journal for December 14th in his pocket, that he might have allowed Mr. Wall to reply to Mr. Harvey by quoting from that gentleman's third Dialogue Sketch,* in which he says, "you must know that Crackdbell and many *many* other worthy folk, more vain than wise, believe that this photography is after all but an ill-natured, misanthropical power, delighting in slander and distortion;" that "as to the hands, the best lens you can get will insist upon making them so monstrously large, that they are nearly as long as the face itself, the absurdity of which you may at once prove by measuring your own hand against your own face."

If Mr. Harvey, as a member of a photographic society and an artist, were to bring the truths of photography to correct the conventional untruths of the painter, he would deserve warmer thanks than he will ever obtain from endeavouring to mislead scientific men, and lead astray those who believe that because he *ought* to be a well-informed and trustworthy guide therefore, he is such. I would also commend to Mr. Harvey the example of Mr. Wall, who, while striving as an artist to elevate photography, also endeavours as a photographer to benefit his brethren of the brush.—I am, dear sir, yours, &c.,

A Believer in Photography, and a Lover of Art.

* See p. 366 of the last volume.

ART PHOTOGRAPHY.

Sir,—I can bear it no longer. I must ease the safety-valve, or there will be an explosion. I have silently and patiently borne this severe castigation for the last eighteen months, but I can bear it no longer.

I fancy I hear you with your editorial indignation saying "what's the fellow mean, what's he talking about?" Well sir, I will enlighten your mind, as well as ease my own, by telling you that this castigation is upon "*Art Photography*," which I have received from you, and your esteemed contributor, "A. H. Wall," through the pages of the News, ofttimes making me dissatisfied with my own productions; why, I dont know, unless it is that I am afraid I have not the *sixth* sense which a contributor to a contemporary said was so necessary to make a man an artist. Why, sir, not many weeks ago, when under one of these fits of dissatisfaction, I went twenty miles to see the works of a professed artist-photographer, and what was my surprise to find that my own were not a whit inferior to his, in fact, I was almost vain enough to think mine were superior.

Then in the name of all that's photographic, what's all this "fuss" about? To make you awake to your deficiencies? well, sir, I am quite awake to them; and now begins my complaining; you tell us of our faults, and wants, but don't tell us how to *remedy* them. I have been waiting a long time for that information, without getting it, except the meagre bits that I find worked up with the lessons on colouring, which your kind contributor A. H. W. is writing for a contemporary (for which allow me to thank him), but to be told after six years study of the science, that you are no photographer, is enough to make the choler rise; but I am determined to be a photographic-artist, and therefore, now sir, what I want is, your advice as to the books I should study, upon the *elementary principles of Art, as composition, (not patchwork,) chiaroscuro, breadth, pose, &c. &c.*

Now sir, if you or A. H. Wall, will inform me which is the *best* book or books, upon the above subjects, I shall be for ever indebted to you. An answer in the News will greatly oblige.—Yours truly,

One in search of Art-Knowledge.

[Our correspondent is in a right state of mind if he really be awake to his deficiencies. Where a man feels that the executive hand comes short of what the conceptive brain desires, he must and will progress. But our correspondent has surely not read our pages carefully, when he says we do not give the remedy for the faults we point out. We had prided ourselves on being pre-eminently practical, and had devised a series of articles to convey the instruction required by photographic art-students in a definite form for reference, and entrusted it to a gentleman eminently capable of conveying the right instruction. We refer to the series under the head of "Technology of Art," &c. by Mr. Wall. The object of that series of short articles is to convey the instruction to the photographer in a connected and brief form, which might otherwise be sought in some scores of volumes written more expressly for the use of the painter. If our correspondent read these and the other art articles which appear in our pages, together with the admirable hints on the balance of lines, &c., by Mr. Lake Price, which appeared twelve months ago, he will scarcely have to complain of the want of practical instruction in art as it relates to photography.—Ed.]

THE TANNIN PROCESS.

Sir,—On further trial I find that the quantity of acid to be used in the tannin process developer should be as much as 30 grains citric acid, to 10 grains nitrate of silver, when the subject contains sky and dark objects, and the tannin solution is of the strength of 30 grains to the ounce. For the above class of subjects, the best rule appears to be, to use with each grain of silver, one grain of citric acid to every ten grains of tannin in one ounce of solution. For subjects containing less contrast, less acid may be used. With regard to the modification mentioned in your last, I do not think it will be found to be an improvement. Nearly a year ago, I worked a great deal with gum arabic mixed with tannin, before trying tannin alone, and found that the former gave very good results, but prefer the latter for the following reasons: in my hands the gum arabic made the film less adherent, the glass being previously covered with gelatine, it was somewhat apt to cause fogging, and unless well washed out, would cause turbidity in the developer.

The use of citric acid will no doubt correct the chief fault the process is liable to, blurring at the edges of the sky or high lights; but the most effective way of using it seems to be in the developer, and the acid used in this manner can be varied in quantity, in such a way that the best results may be obtained with all kinds of subjects from plates prepared by the same method.—I am, sir, your obedient servant,

C. Russell.

Stubbers, near Romford, 3 *April*, 1861.

INTENSIFYING NEGATIVES.

In order to prevent the collodion film leaving the plate, it must not be put into the silver solution until it has *set* sufficiently, develop with iron and fix, then pour on a solution of mercury, made as under:—

Bichloride of mercury	1 grain
Hydrochlorate of ammonia... ...	1 „
Water...	20 „

As soon as the image assumes a rich cream-colour, wash the plate *thoroughly*, and pour over a weak solution of ammonia (one grain to ten of water) or hypo. These solutions can be used repeatedly, and do not require filtering.

Having used the above constantly during the last six years, I can speak with confidence of its value in strengthening negatives, *and the film* NEVER *leaves the glass*. If still greater intensity is required, the negative (after the ammonia has been washed off) can be treated with pyro and silver, and repeating the mercury and ammonia solutions; but the progress of intensity must be closely watched, otherwise the film will become too thick, and the half tones destroyed.

A. Brothers.

Talk in the Studio.

Photographic Grouping.—A paragraph we quoted from the *Athenæum* last week on this subject stated, that a recently executed group of the officers of the 84th regiment was photographed by Messrs. Agnew and Son; we find that the *Athenæum* has since corrected itself, and states that the photograph was by Mr. A. Brothers, of St. Ann's Square, Manchester. We have also received a communication from Mr. Brothers on the subject, giving some interesting particulars. The group consists of forty-one persons with some statuary; the size of the picture was 48in. by 21in.; about forty-five printings were nesessary to produce this group, and it occupied fifteen days in the month of December. All the merit of the grouping, which the *Athenæum*—unwilling to conceive as the result of artistic skill in the photographer—attributed to felicitous chance arrangement, like that which sometimes happens in the chromatic combinations of the kaleidoscope, is really due to the care and skill of Mr. Brothers. We are glad for the honour of the profession to be able to state this, and to add that we can, from the reduced copy of the group before us, fully endorse the high opinion of the grouping. Few things are more difficult in photography than the judicious grouping of nearly half-a-hundred persons, to the whole of whom a proper degree of prominence must be given as portraits. Where a number of the figures can be used at will, in any position or in any degree of subordination and prominence, for the mere purpose of producing the right balance of lines and chiaroscuro, the difficulty of composition are much simplified; but where forty-one portraits have to be produced, and the arrangement made with at least some degree of attention to rank and position in the sitters, the grouping requires judgment and skill of the higbest order. We have occasionally seen some fine specimens of portraiture bearing the name of Mr. Brothers, although he has not been, that we remembe, a contributor to our Exhibitions: we hope to see more of his work. We append an extract from the *Manchester Guardian*, noticing this group, because it is gratifying to photographers generally to have a proper recognition of the value of their art from "outside" critics: The artistic difficulties attending the representation of a large apartment full of gentlemen have been surmounted with a skill almost marvellous. Here are neither long lines of heads "all in a row," nor, on the other hand, are the gallant 41 broken up into isolated groups of two or three, lacking all social cohesion. So ingeniously and artistically has the picture been composed, that one's first impression is that Sir George Wetherall has just risen from his chair, and is about to communicate something of importance to the officers generally. There is no stiffness, no attitudinising; all, whether sitting or standing, are in natural and easy positions; and in this crowd of portraits it is obvious at a glance that they are a crowd of gentlemen. At the vestibule end of the apartment are two statues—one of them John Bell's Victory, with outstretched arm, about to place her wreath on the brow of somo hero. By a singular fortuity, it happened that the officer immediately beneath the chaplet is one worthy of being so honoured—being Major O'Brien, who endured, with a portion of the regiment, the privations and miseries of Lucknow, during the temporary triumph of the native mutineers. The portraits are wonderfully clear and sharp; and those in the background have the perspective duly regarded.

Art Patronage.—We have pleasure in noticing that his Royal Highness the Prince of Wales bids fair to tread in the footsteps of his august father in becoming a patron of the fine arts. The number of photographic portraits his royal highness has already sat for, illustrate his interest in photography, and we understand that Sir John Watson Gordon is now engaged on an oil-painting, and Mr John Steele the eminent sculptor, of Edinburgh, is also engaged on a portrait bust of the Prince.

Photography and Architecture.—We notice that Mr. Sheddon, writing in an architectural contemporary, urges on the architectural profession tho advantages to be gained by the adoption of photographs in place of the architectural perspective drawings now in use.

Photography and War.—The editor of the *American Journal*, in commenting on the attachment of a photographer to each regiment in the French army, congratulates photographers on the fact that there will be little danger in active duties, for the photogropher *must be beyond the smell of gunpowder, or his chemicals will not work!*

To Correspondents.

N. W.—The presence of excess of organic matter in the nitrate bath has a tendency to cause irregular reduction in development. Its presence in moderate proportions favours density of tbe image.

Wm. Brown.—Tbe price charged for printing card portraits varies in different establishments. About one shilling a dozen is, we believe, a common price. We cannot state wbich is tbe best machine for rolling prints.

Narberth.—We do not quite understand what our correspondent wants described. The best form of lens for portraiture is the compound achromatic lens, and the best form of simple view lens the achromatic meniscus. For copying, architecture, and many other purposes, Dallmeyer's triple lens. Narberth should pay the postage of his letters wben writing to an editor for information.

F. P.—The *Chemical News* is published weekly, it is edited by Mr. Crookes, and published by Griffin and Co. The price is fourpence. There is no specific work on the subject, the information is scattered in various works. Employ a portrait lens for flowers, &c. An expanding camera is quite suitable for general purposes.

Tit Tat To.—It is better to make a new alkaline gold batb each time it is required for use; but if you consult the article on the subject in tbe Photographic News Almanac you will find a formula for one which may be kept and used again. It is best to use new hypo for fixing, and kaolin should not be used in the hypo at all. A bromo-iodized collodion should be used in tbe Fothergill process, and in tbat case it is best kept ready iodized.

J. C. B——d.—We think you might possibly succeed by making your want known in our advertising columns. Should we bear of anything likely to suit you we will bear you in mind.

J. Kirk.—Transparencies for the magic lantern may be produced either by the superposition of tbe negative upon a dry plate, or by means of camera printing. You will find various articles on tbe subject already scattered through the pages of the News, and we shall have more on the subject shortly.

G. Cockburn.—There are many good instruction books published, so that it is invidious to mention any specific one. See our advertising columns.

Hopeful.—It is best to add the bromide to the iodizing solution. If tbe collodion be already iodized, then dissolve the amount of bromide in the smallest quantity of alcohol possible, and add the solution to the collodion. The bromide of cadmium is the most soluble, and that of ammonia next so. You have misread Major Russell's formula: he says two grains of bromide to three of iodide, and means that proportion to each ounce of collodion. Solarization may arise from several causes; the remedy is either the addition of a bromide to the collodion, or the use of citric acid in the developer. Maxwell Lyte's gold toning formula does not remove the size from the paper.

F. E. G.—The strength of gelatine solution for coating the plates, in the tannin process is 2 grains to the ounce of water. See remarks on the subject in another page. Both gallic acid and pyrogallic acid have been used, and answer the purpose to some extent, but not so well as tannin.

H.—In drying the plate with a spirit lamp take care that it gets equally heated, and not too hot, or it will be liable to crack. A little judgment must be exercised here. If the albumen be poured on the plate gently you should not have bubbles. I can only conjecture tbat in plates 3 and 4 you have either failed to clean the plates thoroughly, or bad immersed them before the film was quite dry. Chloride of sodium may be used instead of chloride of ammonium. In allowing the plate to dry spontaneously there is great danger from dust, wbicb is a great enemy to tbe albumen process. The vessels may be cleaned witb a warm solution of soda and water.

R. N.—The formula for toning without gold was given in the record of patents in the Almanac, and in more detail at page 349 of our last volume.

Phos.—In many respects your formula for instantaneous photography should have given you good results, but we will give you the modifications we think desirable. Your present formula for collodion contains more than twice as much iodide as pyroxyline; use just double the quantity of the latter, which will give you five grains to the ounce, reduce the iodide of cadmium by one or two grains in the quantity stated, and use as solvents equal quantities of ether and alcohol. Add a very little acid to your bath, when quite neutral it is difficult to get clean pictures. Use a 20-grain iron developer with 20 minims of glacial acetic acid, and intensify with pyrogallic acid as you state. The pieces of negative you forward have the appearance of under-exposure, and indicate a bad light. As you do not state the kind of lenses you used, except that they are Ross's, nor the size of stop, we cannot form much opinion of the proper time. You do not state anything of the character of the pyroxyline, it should be of a charaoter tending to to give intensity. If you had not stated that the bath was neutral we should have judged from the negative that it was an old bath containing excess of nitric acid. The stereos you forward are good, but we still cannot conceive how you got good negatives with a collodion containing only 2½ grains of pyroxyline to tbe ounce. We shall be glad to hear of your further success.

Troubled.—You should not attempt to print from a negative intensified with mercury without varnishing, spoiled prints will certainly result.

S. L. K.—Other things being equal, small lens of short focus work quicker than large lenses of long focus. The best test for a silver bath is the mode in which it works; but you may test for acidity or alkalinity with litmus paper. If it turn blue litmus paper red, or any tint between blue and red, it is acid. If not try it with litmus paper whicb has been reddened by holding over the fumes of acetic acid. If it then turn the reddened litmus blue it is alkaline. Positives on glass can be intensified after fixing with cyanide; but unless they are very full of half tone to begin witb, they will make hard unsatisfactory negatives.

J. C.—Positives on paper properly fixed in new hypo are as permanent as toned prints, but they are red and foxey in colour.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to the Office, 32 Paternoster-Row, London.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 136.—*April* 12, 1861.

THE NEW METHOD OF INTENSIFYING.

Since our last we have had opportunity of trying a few more experiments with the method of intensifying we then described, using the fumes of mercury and iodine, instead of solutions and their salts. As regards the simplicity, safety, and efficacy of the method we are more than ever convinced, and feel assured that all those who have facilities for trying it will be gratified with the possession of a reserve power which at times may prove exceedingly valuable.

We stated before that where the negative to be intensified was placed over the iodine first, and then over the mercury, the action did not seem satisfactory. On further experiment we notice the curious fact, that there appears to be no action at all of the mercury on the iodine when that order of exposure is pursued. When the collodion picture is subjected for a few minutes to the fumes of mercury, and then to the fumes of iodine a yellow iodide of mercury is rapidly formed. But if the collodion picture be first submitted to the fumes of iodine, and then to the vapour of mercury, no such action is manifest; the mercury does not appear to have produced any effect at all. But what is more singular, a further experiment proves that the mercury really is deposited, although no iodide of mercury is formed, nor any mercurial coating visible, for on placing the plate again over the iodine after leaving the mercury, the yellow iodide is quickly formed.

There are one or two practical points it may be of interest to name. We notice that when a thin negative has been exposed for a time to the vapours of mercury, it acquires some additional intensity, even without further treatment. When it has been submitted after this to the iodine, it rapidly, as we have stated, acquires a coating of yellow iodide of mercury. This coating is in the first instance superficial, completely covering the surface of the negative in regular gradation, and strengthening the half tones in equal ratio with the high lights. It does not at first, however, permeate the film, a longer exposure being necessary to effect that where it is desired. By the time this yellow iodide has thoroughly permeated the film, so as to show equally at the back and front, it occasionally happens that a great and sometimes irregular accumulation of red iodide has taken place on the surface. This will be removed on application of the varnish; but to prevent any chance of stains or patches occurring, we have poured about a drachm of alcohol on to the film, allowing it to flow all over, which has at once dissolved and removed all irregular surface deposit, leaving only an even film of bright yellow.

From some questions we have been asked it may be desirable to state, that no deposit of mercury or iodine takes place except where a previous deposit of silver has existed, consequently the deep shadows remain untouched; but the slightest deposit of silver, indicating the faintest half tone, receives a deposit, and becomes definitely marked where it had appeared latent before, so that an increase of softness, detail, and gradation, rather than any tendency to hardness is the result.

We have used for protecting the film a benzole varnish; but we see no reason why any good varnish should not perfectly answer the purpose.

TURPENTINE WAXED-PAPER PROCESS.—A NEW DRY PROCESS.

We have received from the Rev. J. Lawson Sisson, of Lausanne, half-a-dozen stereo negatives by the turpentine waxed-paper process, with which we are at once delighted and surprised. For sharpness and delicacy, vigour combined with exquisite gradation, together with freedom from granulation, we have seen nothing in waxed paper to equal them. It is not saying too much to describe them as nearly equalling some of the finest collodion negatives, whilst they far surpass many. The only waxed-paper pictures we have seen which, in our estimation, equalled them, were a few we saw some months ago, taken by Mr. Hooper, by printing in the pressure-frame from glass negatives, produced in the course of some experiments with a modified waxed-paper process, but which, if we remember rightly, did not succeed satisfactorily in the camera for negatives. As Mr. Sisson states, he has not any new particulars to communicate regarding his process, we apprehend they are produced by the method described in his pamphlet, published by Marion. Than the delicacy of definition exhibited, obtainable by this process, nothing finer could possibly be desired for large pictures, and for those gentlemen desirous of using Mr. Sutton's panoramic lens and camera, but are deterred by the real or imaginary difficulties of manipulation, these difficulties are reduced, by a process like this, to child's play.

We have also received from Mr. Sisson some very fine stereoscopic prints, amongst which we find two that arrest our attention by the description on the back, which is to this effect, "A new *dry* process (not preservative, but dry) developed with iron: time of exposure ten seconds," in another the time of exposure is "fifteen or sixteen seconds." There are no details as to lens, aperture, or light; but we, nevertheless, arrive inferentially at the relation in rapidity this bears to other dry processes. In the same parcel are other stereographs described as by the raspberry syrup process, in which the exposure in sunlight has been two minutes. We apprehend, therefore, that the same lens and stop were used in both cases. If inference be correct, we have a dry process eight or twelve times as sensitive as the raspberry syrup preservative process, which possesses at least average sensibility amongst dry processes. If we are right this is the most rapid dry process, except that of Dr. Hill Norris, in existence.

We have no particulars of the nature of the process, but we have written to Mr. Sisson asking for such particulars as he may wish to publish; which, if we receive, we hope to lay before our readers at an early period.

SOIREE OF THE PHOTOGRAPHIC SOCIETY.

The soiree held in connection with the Photographic Society on the evening of Thursday, the 4th inst., in the large hall at King's College, was a complete success. We are not aware how many cards of invitation were issued, but the attendance was great, not less, we imagine, than five hundred persons being present. These comprised, in addition to members and exhibitors, a large portion of the *elite* of literary, artistic, and scientific society, amongst whom we may mention specifically a large number of members of the Royal Society. There was also, as might be anticipated on such an occasion, a large attendance of beauty and fashion, adding their charms to those of science and art.

The large hall of the College was adorned by the majority of the photographs from Pall Mall, which, from the ample space afforded for judicious arrangement, and the excellent light, were seen, in many cases, to much greater advantage than in the original exhibition. There was, in addition to these, a large number of photographs which we had not before seen exhibited; amongst which we may name, as having especially come under our attention, some of the exquisite specimens of coloured and uncoloured portraiture by Mr. T. R. Williams. Mr. Rejlander was present with a portfolio of his gems of photographic art, which enchained the attention of many, but which for their full enjoyment require a quiet hour without the distracting circumstances of a fashionable soiree. We may mention one of the pictures in Mr. Rejlander's portfolio, which interested us much; it is a portrait of that gentleman himself in the costume generally worn by Garibaldi, and the likeness of the two heads, judging from the published portraits of the Italian patriot, is quite startling. A frame of photographs executed by Messrs. Spiller and Crookes, showing the various stages of the eclipse of last July, excited much attention. The photography was very perfect, and the series possessed a scientific interest not surpassed by anything in the room. A frame of instantaneous stereographs of Madeira also arrested our attention by their excellence, many of them being similar in subject to those of Wilson, of Aberdeen, to whose productions they were scarcely inferior. The name of the artist escapes us at this moment.

We must not omit to mention as exciting much admiration some most exquisite sculptures by Durham. A child nursing a dog, hushing it to sleep, is one of the most charming things we have seen; folding it tenderly to the bosom with one arm, the finger of the other hand is held up admonitorily, the title being "Go to sleep!" The whole pose, sentiment, and treatment are perfect. The fact that Mr. Durham is a photographer, and a member of the Council of the Society, will not lessen the interest of his sculptures in the eyes of photographers.

Several tables, displaying apparatus and chemicals, were exhibited; amongst the firms thus represented we may mention Messrs. Murray and Heath, Horne and Thornthwaite, the London Stereoscopic Company, and Mr. Solomons. Some of the chemicals exhibited by Messrs. Horne and Thornthwaite deserve mention as very fine specimens, beautifully prepared; a sample of chloride of gold excited much attention from the mode of its crystallization.

The stereotrope, or stereoscopic thaumatrope, invented by Mr. Shaw, was exhibited on one of the tables, and excited much attention. The object of this instrument—exhibiting stereoscopic objects in motion—has been before described in these pages. We could not examine it with minute attention in the room; but whilst, undoubtedly, very ingenious, it struck us that the effect was not very perfect. The objects exhibited were to show machinery in motion, and that motion struck us as jerky and unnatural, and not as suggestive of the calm, resistless power with which we are generally impressed on viewing the motion of machinery.

Refreshments were served in the library of the College. Altogether the arrangements were very perfect and successfully carried out, the result being that enjoyment and satisfaction were universally apparent. We repeat, the soiree was a great success.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

An account of the various chlorides which are used in photography will appropriately follow a description of the iodides and bromides. First in importance stands common salt—or *chloride of sodium.* This important body is obtained for commerce either by extraction as rock salt from salt beds, which occur in various parts of the world: or by the evaporation of sea water, either in the sun or by artificial heat. The properties of chloride of sodium are so well known that any detailed description is unnecessary. It crystallizes in cubes, octohedrous, or hollow square pyramids; it is either transparent or translucent. When it has been rapidly crystallized it decrepitates in the fire, owing to its having enclosed some of the mother liquor, mechanically between the individual crystals. It fuses at a red heat, and forms a crystalline matter on cooling, at a white heat it volatilises. One part of salt requires 2·7 parts of water to dissolve it; and there is one curious property which characterises this salt, which is, that it is equally soluble in water whatever be the temperature, boiling water not dissolving more or less than water at the freezing point. It is slightly soluble in dilute, but almost insoluble in absolute alcohol.

The impurities in commercial salt such as is used for culinary purposes, may be iodide and bromide of sodium, sulphate of soda, chlorides of magnesium and calcium, and sulphates of magnesium and calcium. These give it a sharper, and more bitter taste, and may be separated by dissolving the salt in water so as to produce a saturated solution, and then evaporating at a gentle heat to half its bulk. Chloride of sodium will crystallize out, whilst the impurities will remain in solution. In cases where there is a great amount of sulphate of lime present, this will separate with the chloride of sodium, and must be separated by precipitation. For this purpose add to the liquid a weak solution of chloride of barium, drop by drop, until no more precipitate falls down; then filter from the precipitate, which will contain all the sulphuric acid in the form of sulphate of baryta, and add to the clear filtrate a dilute solution of carbonate of soda until all the baryta is precipitated, boil the liquid well and filter. The excess of carbonate of soda present must then be neutralized with hydrochloric acid. The solution upon evaporation will deposit pure crystals of chloride of sodium.

The insolubility of chloride of sodium in alcohol has prevented its being employed in collodion, for this purpose other chlorides must be taken.

Chloride of Ammonium, or sal-ammoniac, is prepared on the large scale either by the distillation of soot prepared on purpose by a particular method, or by neutralising crude carbonate of ammonia with hydrochloric acid or a chloride; or it is first converted into sulphate of ammonia by mixing it with sulphuric acid or a sulphate, when it is easily converted into chloride of ammonium by heating it with common salt. The salt is generally separated from most of its attendant impurities by sublimation, whereby it is obtained in grey or brown-coloured cakes of a fibrous texture. From these it may easily be obtained pure by a second sublimation on the small scale, or, as that operation may be difficult for amateurs, by dissolving as much in water as the latter will take up at a high temperature, filtering whilst hot and cooling. As the temperature becomes lower, chloride of ammonium crystallizes out in white crystals. These, when collected and dried, will be quite pure. Chloride of ammonium crystallizes in regula roctohedra, cubes, or feathery crystals. When in lumps it is difficult to powder. When heated it volatilizes undecomposed and without previous fusion. It is permanent in the air, of a sharp saline taste, and is neutral to test paper. When exposed to the air, a solution of chloride of ammonium loses ammonia, and becomes acid to test paper. For this reason the solution of the salt should not be employed for delicate photographic work, after it has been long exposed to the air. In this case it must be tested with blue litmus paper, and if it shows an acid reaction a little ammonia must be added till neutralised. One part of chloride of ammonium dissolves in 2·7 parts of water at the ordinary temperature, and in its own weight of boiling water. It is sparingly soluble in alcohol, although more so than the corresponding sodium salt.

Chloride of Barium is a very important chemical, both to to the photographer and scientific man. It is prepared in commerce in several ways; one of the simplest is by decomposing an aqueous solution of sulphide of barium (obtained by igniting heavy spar, or native sulphate of baryta, with carbon) with hydrochloric acid. The liquid is then boiled for some time in a porcelain dish, until all the sulphuretted hydrogen is evolved, when it must be filtered from the precipitated sulphur, and evaporated to the crystallizing point; on cooliug, chloride of barium separates. Another plan. which might be advantageously employed in some localities, is to decompose the native carbonate of baryta by means of hydrochloric acid. The two are mixed together, and boiled in a glass or earthern vessel until no more carbonic acid is evolved, when the liquor must be filtered, evaporated, and crystallized. In either case the crude salt must be partially purified by solution in water and re-crystallizing.

The commercial salt may be contaminated with several impurities, such as chloride of strontium, chloride of calcicum, chloride of aluminum, sesquichloride of iron, and sometimes cyanide of barium. The first and second impurities (chlorides of strontium and calcium) may be removed by finely powdering the salt and boiling with moderately dilute alcohol. The two chlorides dissolve out and leave the barium salt free from them. Chloride of aluminium and sesquichloride of iron arise from the presence of clay and oxide of iron in the mineral. They are decomposed by exposing to a red heat, or they may be precipitated by boiling with baryta water, or dissolved out, like the previous chlorides, by means of alcohol. Cyanide of barium is a very rare impurity; it may be detected by its giving a blue colouration with salts of peroxide of iron. If present it may be removed by boiling the salt with hydrochlorie acid.

Pure chloride of barium crystallizes in transparent colourless tables, which are permanent in the air. They decrepitate in the fire like chloride of sodium, and probably from the same cause. They are of a bitter, sharp, and unpleasant taste, excite nausea, and act on the system as a strong poison. 100 parts of water at zero dissolve 32·5 parts of the chloride, and at the boiling point 78 parts. If hydrochloric acid be present much less is dissolved, the strong acid dissolving hardly any, so that a saturated solution in water is precipitated by it. It is almost insoluble in alcohol, 1 part of the salt requiring no less than 4857 parts of boiling alcohol to dissolve it.

Chloride of Strontium.—The simplest way to prepare this salt is to ignite cœlestine (native sulphate of strontia) with one-third of its weight of charcoal, to extract the mass with hot water, and then to saturate the filtrate with hydrochloric acid in the way recommended for the preparation of chloride of barium. It crystallizes in long, six-sided needles, containing six atoms of water; when heated they fuse and are converted into anhydrous chloride of strontium. They deliquesce only in moist air, dissolve in less than their own weight of cold water, and in every proportion of hot water, like the baryta salt it is precipitated from its aqueous solution by hydrochloric acid, although not so completely.

The chief value of chloride of strontium to the photographer resides in its great solubility in alcohol, by which it can be employed for the purpose of chlorising collodion, to which it communicates valuable properties. One part of chloride of strontium in crystals requiring only 24 parts of cold and 19 parts of boiling absolute alcohol for their solution, whilst in dilute alcohol they are far more soluble.

PRINTING ON IVORY.

BY SAMUEL FRY.

THIS department of the art of photography is one that of necessity comes more under the notice of the professional photographer than the amateur, as prints on ivory have, until they have been under the pencil of the miniature painter, no especial feature which renders them of particular value.

The first desideratum, and one in which it is necessary great caution should be used, is the selection of the plates of ivory. There are now in the market two kinds, presenting very different appearances. The first is that which is well known as leaf ivory, and is cut across the grain of the tooth, according to the size of which it displays more or less of what are technically known as mackerel marks, which are much more strongly developed in some plates than others. But care should be taken to choose cuts from the centre of the tooth, where there is a considerable space without these marks, which on printing the picture come out very strongly, and when they happen to strike across the face of a miniature can scarcely be overcome by the painter. The second kind of ivory is that known as twist ivory, and is so called from its being cut by a saw working vertically, whilst the tooth or tusk is pressed hard against it at an acute angle; the result is, that, by the tooth being made to revolve, a sheet of ivory is obtained, far larger than can be cut transversely from even the largest teeth, and possessing also the important advantage of having no grain or mackerel mark in it. But there is another side of the question; this ivory is so much more expensive than the other, that where only small pictures, say not more than 3¼ by 4¼, are to be produced, few would incline to pay the price, and for my own part, where the opportunity of selection is at hand, I should choose those pieces of the ordinary leaf ivory, which have the broadest space in the middle without grain; these plates should have one side smoothed, till all saw marks are obliterated, and the surface is as polished as a piece of writing paper, and all pieces not in this state should be rejected, although by means of fine emery a very near approach may be made to it. Having chosen the plates of ivory, the next step is to bring the prepared surface into a proper condition to receive the impression, and which is thus accomplished. Prepare a mixture thus:—

Albumen	... ...	1 ounce
Chloride of sodium	... ...	3 grains
Citrate of soda	... ...	3 „
Ammonia liquor	... ...	3 min.

Let the mixture be most diligently agitated by a whisk until it is all froth. Now put aside, and allow it to settle down, when it may be decanted for future use, as the ammonia will preserve the mixture from decomposition, and it will improve with age, until three or four months old; to use this solution take a good rigid camel-hair brush, I prefer a flat one, half-an-inch wide, and lay the albumen carefully over the smooth side of the ivory, taking care to pass the brush in the direction of the grain, and straight down only, not up and down; when the surface is quite smooth put it aside to dry on the back, out of the way of dust, and, if possible, in a room of which the temperature is not lower than 70° or 80° Fahrenheit, as the albumen at this heat dries on the surface, and is less troublesome at a subsequent part of the process. These plates should be wrapped up when done, each in a separate piece of tissue paper, to avoid scratches. When a picture is to be printed, float a sheet of ivory on a small quantity of eighty-grain solution of nitrate of silver. It is of great importance to be quick in placing it on, as the plate curls up instantly, and if it have not touched the fluid all over, or if there are bubbles under it, it is very probable that, in attempting to rectify this, that the solution will get on the back of the plate, and thereby cause marks of more intense action in the picture at the parts over the spots.

The sensitizing should always be done in the dark room, as the action of light on the animal substance of the ivory when covered with the surface of the chloride of silver, is far more rapid than on paper, either albumenized or plain salted.

When the floating has continued for three minutes, remove the plate with horn pincers, and set it up on end to drain for a few minutes on a piece of bibulous paper, which done, lay it on its back in a drawer or cupboard to dry, meanwhile preparing the negative for producing its print in the following manner: the great distinction between printing on paper and on ivory is in the fact, that the former, when in the pressure-frame allows the progress of the picture to be inspected by bending in the middle; whilst the latter being rigid cannot be so treated. It is, therefore, necessary to take a piece of white note-paper, the size of the negative plate, gum one end of it a quarter of an inch deep, stick that end at the back of the lower part of the negative, then turn the paper round to the face of the negative.

Now take the plate of ivory and place at each corner of the back a touch of gum, then lay it on the face of the negative in its right place, and turn the piece of paper, already in place, down over it, the gum at the corners of the ivory will adhere to the paper, and it can now be all put in the pressure-frame together. As I just noticed, the printing is very rapid, and should have great attention, and the frame never be opened but in the yellow-room, or all the finest tones are soon lost.

To see the progress of printing it may be taken quite out of the frame, as the paper keeps the ivory in position.

The over-printing should be considerable, as in the subsequent processes it is often the case that much reduction is made in the intensity of the picture.

The picture, as we may now call our production, being removed from the frame, wash it in running water for ten minutes, rubbing it carefully on the surface with the finger, when it will be found that the whole of the albumen will rub off as a powder, *leaving the picture on the very surface of the ivory*, and with the pure face of that beautiful material unsullied. I know very well that at this point the practical photographer will exclaim, "but albumen is rendered insoluble by contact with nitrate of silver, and cannot be removed;" so thought I, but it will be found that there is no difficulty whatever in rubbing it off under a stream of water, and the plate may then be transferred to a fixing bath of gold as usual for paper; but as the picture, when painted, will be of considerable value, it is of vital importance that the bath be strong of gold and hypo, and by no means acid. About ten minutes is sufficient to produce a good colour, and one well suited for painting on. I find that generally preferred is a purple or dark sepia tone, rather than black, which often presents great difficulty to the painter in fair complexions. Now remove the plate to a bath of strong new hypo for ten minutes, and thence to running water, in which it should be rubbed with a sponge for the first ten minutes, directing the stream full on the plate. It should be left to wash in this stream of water for twelve hours, and then taken out and dried with a silk handkerchief.

It is now more than likely that on placing the picture on a piece of card it will be found too dark for painting, in fact, it is as well it should be so, for by the next process the tone can be regulated with such exactness that it is unimportant how dark it now looks.

Prepare a weak solution of cyanide of potash, say 5 grains to the ounce of water, and use it for no other purpose than the one now to be indicated, and above all things avoid using it for dissolving the iodide of silver from negatives, the result being that the solution becomes charged with cyanide of silver, and utterly destroys the ivory picture in a very short time. Now take a camel-hair brush and go carefully and very rapidly over the background of the picture with this mixture, working carefully round the hair, and it will at once be seen the colour is giving way under the cyanide, continue this treatment until the whole or nearly all of the background is gone, and the ivory left as clear and white as before any chemical operation was commenced on it, on this the painter, of course supposing he possesses the requisite talent, can produce those lovely effects for which ivory is unsurpassed by any known material. Now with the same solution go rapidly all over every part of the picture which requires to be made lighter, and by having a brush at the other end of the pencil dipped in water, the action may be moderated to any extent. By this means, in skilful hands, and after a little practice, excellent effects may be obtained,—heavy sombre shadows removed, a frowning forehead made more cheerful, high light judiciously thrown, leaving the clear surface of the ivory covered only with a delicate tint on which the painter can by transparent colours give the finest of flesh tints, and all that play of colour which the artistic eye perceives in the human countenance, with a force, vigour, and correctness to nature, such as can rarely if ever be approached by means of any other medium. When the cyanide has played its part, wash for five minutes under running water, and from its complete and ready solubility the removal is easily effected.

It will be perceived long ere this by my reader, who is *au fait* at photographic processes, and in the habit of drawing inferences therefrom, that the two main principles involved in the process I have described are, first, the supporting the picture on the surface of albumen, which, having fulfilled its object, is removed; and, secondly, the production of any required depth of picture, and the clear background, by means of the cyanide of potassium.

Were the albumen omitted, the solutions would sink into the plate, and the result be most unsatisfactory; and, on the other hand, it is seldom that without the use of the cyanide the exact tone is produced, from the fact of the ivory drying up, several shades darker than it appeared when wet, as a plate of ivory when thoroughly soaked in water is very transparent. I am also inclined to believe that a picture, which has been under the action of cyanide, is more securely fixed than when it has been under hypo only; but it is necessary that most copious washing be given to the picture between the operations, or stains are produced by the mutual action of the two chemicals. It will not be a matter of the smallest surprise to me to learn, on the publication of this process, that some one else has also discovered it; but I have never at any time either read or had described to me any process, either in detail or in part, which had for its object the production of a photograph on ivory; and though repeated requests have been printed in the journals for information, no reply of any kind has to my knowledge been given.

It is far from impossible that those engaged in the production of photographs on ivory as a professional affair may raise objections to parts of my process, but my answer to such would be the good results obtained.

In conclusion, if I have been prolix or tedious in my description, it arises from a wish to give the fullest instruction on every detail of the process; and those in the habit of trying new processes will readily forgive the writer for his errors in this direction.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Breadth.—That quality which groups the lights and shadows into separate masses, so as to avoid the spotty, complicated effect of light and dark, of which a chess-board may be representative. Breadth must be considered, in connection with other pictorial requisites, such as *repetition*, balance, &c., but at the same time its importance stands before them all; its simple grandeur of effect and its vital consequence are such that it must govern every portion of the work The forms must be grouped and the outlines selected with a special view to this, while the lights and lighter tones must be massed together, as also the darks and the shadows; the lights being diffused from their focus, the sombre tones from theirs, and equal contrasts being carefully avoided. Where breadth exists, other pictorial qualities must be; where breadth is not, all other pictorial qualities have but small value. You cannot well overrate its importance. Crude patches of light or dark destroy it. Harmonious gradations at once secure it. Perfection of detail will not banish it, nor does the absence of detail produce it; let those who think the contrary say what they will. The mind and power of the artist stooping to the wearying and exhaustive labour of securing minute detail may become weakened, and thus other qualities of higher importance be sacrificed; but photography produces the most minute and delicate details by far different means, and the artist photographer will find, as Delaroche said, that "the finish of inconceivable minutenesss disturbs in no respect the repose of the masses, nor impairs in any way the effect of the whole." Ruskin, writing of breadth, says, "the character of the whole composition may be broken or various, if we please, but there must certainly be a tendency to consistent assemblage in its divisions. As an army may act on several points at once, but can only act effectually by having somewhere formed and regular masses, and not wholly by skirmishers; so a picture may be various in its tendencies, but must be somewhere united and coherent in its masses. Good composers are always associating their colours in great groups; binding their forms together by encompassing lines, and securing, by various dexterities of expedient, what they themselves call 'breadth;' that is to say, a large gathering of each kind of thing into one place; light being gathered to light, darkness to darkness, colour to colour. *If, however, this be done by introducing false lights or false colours, it is absurd and monstrous;* the skill of the painter consists in obtaining breadth by rational arrangement of his objects, not by forced and wanton treatment of them * * * *Generally speaking, however, breadth will result in sufficient degree from fidelity of study—nature is always broad;* and if you paint her colours in true relations you will paint them in majestic masses." *Indiscriminate* imitation, however, must not be relied upon; the few photographs that exhibit real breadth go to prove this. The educated eye may find but little difficulty in selecting such views as produce breadth; but the quality won't seek, it must be sought. Breadth of chiaroscuro will, for landscapes, be most readily found when the shadows begin to lengthen and the light comes from either the right or the left, but much will, of course, depend upon the character of the view. The photographer, whose aims are bounded by the mechanical, will exclaim, "What control have I over these matters? I must take things as they are." True, and so must the painter—but here lies the difference. You clap down your camera, focus your view, calculate the exposure, and so go your way; while the thoughtful artist, whether painter or photographer, gazes long and steadily upon the scene—moves here to avoid taking that into his picture, or there to get in this—moves forward to enlarge one object, or backward to diminish another—shifts his position to escape getting the illuminated portion of a group of trees which it is desirable should be all half tones and shadows, or again shifts to escape a patch of dark shadow which comes crude and harsh against his mass of lights, &c. &c. &c. Contrast your production with his afterwards, and you will understand the value of all this additional head labour. The one has, even to the commonest observer, a mysterious charm attracting and retaining every gaze, the other is little, commonplace, and uninteresting. The one intellectual, the other mechanical. The one is noticed merely from its method of production, the other is a work of art winning admiration from its own intrinsic beauty, without hardly a suggestion of the means by which it sprang into existence. Another feature in this quality of breadth is the feeling of unity and repose which it engenders—there is nothing violent, jerky, harsh, or crude—harmony pervades every part, and unity makes the whole perfect. If you want to secure breadth, avoid "*patches,*" let every demi-tint and every dark belong to a group of a similar kind, and the two groups be themselves associated as a whole. There are those who, misunderstanding the term breadth, imagine that it merely signifies two or three patches in the place of many; who, hearing that a chessboard represents the reverse of breadth, suppose that to sweep all the darks into one corner, and all the lights into another, would produce this much-sought quality in all its charms. But this would only decrease the number of patches without at all changing their character. The great Titian wisely described breadth by pointing out a bunch of grapes, in which, although each individual grape had its due rotundity and character secured by light, shadow, and reflection, the illuminated side formed one broad mass of light, and the shadowed side one broad mass of dark—the one being, nevertheless, sweetly united with the other as parts of the whole. Sir Joshua Reynolds said, "the slightest sketch where this breadth is preserved will have a better effect, will have more the appearance of coming from a master-hand, that is, in other words, will have more the characteristic and *generale* of nature, than the most laborious finishing where this breadth is lost and neglected." Nothing is more destructive of this much-lauded quality than the patch of white photographers have so frequently placed where a sky should be. Howard, in his "Sketcher's Manual," says, "The definition of the quality termed 'Breadth' involves an apparent paradox. Breadth of light or shadow does not mean a broad space of *equal* light or *equal* shadow, that is, Flatness. Breadth is used in contra-distinction to Spottiness; and a space of equal light, *however broad,* is but a spot or blot. There is an abruptness or harshness, in Flat or equal light and equal shadow, that is totally destructive of pictorial effect. A few remarks on the choice of light may assist the photographic amateur in securing breadth. When the light is limited to some one source—such as a window or similar aperture—the depth of the shadows will be in proportion to the strength of the light. Should the light be very bright, the shadows will be very dark; and it will then be necessary so to arrange your model or models that the rays do not by striking some prominent portion of a part, surrounded by intense shadows, create a crude patch of light, where all should be kept subdued and low in tone, as this would destroy breadth. In dull weather out of doors, the shadows are so faint as to be scarcely visible, and there is then consequently very little chance of obtaining breadth. In direct sunlight the shadows are clear and well defined, but by no means strong, owing to the presence of very powerful reflected light. The altitude of the sun rules the length of the shadows, which are longer in winter than in summer, because the rays (which are always *in effect* at least parallel), then fall more obliquely. If the light fall full on the view from behind your camera, there will be some difficulty in obtaining breadth, and so there will be if the light be immediately before the camera. When the sun is concealed by clouds, the lights and shadows grow indistinct, but frequently while this is true of one part of the landscape, some opening in the clouds may give to another part quite a contrary effect. Taking advantage of such *accidents,* excellent effects of breadth are obtained. Cast shadows too, being always darker than mere shade, may be frequently sought to aid in securing this quality. When you wish to obtain a little of more powerful lights and darks in your picture, for the sake of breadth, you may remember that the nearer objects are to your eye, the more brilliant and forcible are the lights and shadows. All these brief and confessedly imperfect hints are as much to be applied in making a selection from nature, as in composing or designing from the memory or imagination. In nature, lights and shadows vary rapidly in position, intensity, and contrast, and the artist can generally discover such a point of view, as will tend to produce ample breadth of chiaroscuro, if he have but the patience to wait, the diligence to seek, and the eye to detect. In concluding this subject I will add one more quotation from George Barnard's work on landscape painting. "*Art can never surpass nature,—the grandest effects produced in pictures are but feeble in comparison to the glorious reality. Let us examine then with the greatest care, those circumstances and effects best adapted to charm the eye, once understood, they will become firm data on which to found our system of art.*" * * * To constitute a picture there must be a fortunate combination or careful arrangement of lines and forms, and a favourable moment must be chosen for catching the light and shade most appropriate to the subject. The importance of the latter must be at once evident from the consideration that the same subject may present itself under various effects of lights and shadows, many of which would, if represented in a picture, distract the attention from parts more worthy the spectator's notice; *and that it is only by devoting themselves to a careful study of well digested rules, and a constant reference to faithful* *delineations of nature, that students can hope to build up a system which will enable them to express the various sentiments they may wish to convey.*" Thus speaks the painter to artists with brushes and pencils; what is there in such remarks that need be left unsaid to artists with cameras and chemicals?

Photographic Tourist.

PHOTOGRAPHIC RAMBLES IN WALES.—No. 2.

BY J. H. JONES.

Old associations, and the pleasure derived from excursions in the Principality in earlier days, were not without their influence in causing me to make the following excursions with the camera, by means of which I should be enabled to obtain pictures of such places and scenes, which ties of early friendship, warm greeting, hospitality, and pleasant companionship, in my rambles through this beautiful country had endeared to my heart, combining, as the country does, so many features to interest the imagination and to allure the eye.

As I wander through this old birth-place of legends and fairy lore, famed alike for triumphs of the sword, and prizes of the lyre, to how many recollections does it give rise, as I look back to those bright days so indelibly impressed on memory's tablets. Like the wearied pilgrim from some far off clime, I seem to renew my existence as the scenes familiar to my boyhood dawned upon me; again I breathe the freshness of the morning hour; while my mind is filled with pleasure, for I was once more amidst the wild blue hills of Cambria.

How often has a strange feeling of the fleeting tenure of all human enjoyments filled my heart, as I have bent my steps to some ancient castle or ruined abbey, which has been the retreat of those who have long since passed away.

Many an hour and many a day have I spent in my boyhood, exploring the wildest recesses of the old glens, and lakes, and hills. And where is the human being who has not, like myself, had reason to contemplate with sensations too strong for utterance, some well-remembered spot—who has not felt himself belonging to the past, even while by his anticipations he has turned tremblingly to catch the shadows of the mysterious future?

It is in the presence of the monuments of ages passed away—of a beloved country whose fame and splendour have vanished—that we can best sympathize with the transient show, and the sufferings of humanity, like the vanquished Roman of old, who sat down amidst the ruins of a fallen empire and wept.

In its monumental grandeur—with the foot of heroic nations everywhere upon its soil—no country presents objects of more peculiar and varied interest than Wales.

The prize of contending invaders, it was long the stronghold of genuine British valour, and maintained for upwards of twelve centuries unequal conflicts with nations far more powerful, yielding only on condition of being governed by a prince born in the country; hence, Edward the First's policy in bringing his queen to Canarvon Castle, A.D., 1284, that his son might be born there; from which time down to the present have not the sons of our English sovereigns assumed the name of Prince of Wales, as the proudest of their titles?

Nothing more clearly proves the importance attached to its possession than this simple historical fact. Nor does the voluminous character of the works devoted to its illustration tend to diminish the curiosity with which we retrace its annals, call to mind its former power, and now its great natural advantages, its increasing usefulness and prosperity. No traveller enters the principality without being surprised with evidences of its singular history, its numerous antiquities being no less striking than its splendid and romantic scenery.

The arena of successive and fierce struggles—commencing with the dawn of the Christian era—here met the Roman, the Saxon, the Dane, the Norman, and all these blending in the resistless English, Cambria still continued to bear a conspicuous part in the grand drama of British power and greatness.

The reduction of the native inhabitants and princes, in their mountain fastnesses, required the lapse of ages, and the strength of combined nations to accomplish. These persevering efforts to vindicate their freedom, gave rise to extraordinary exploits, which, terrible as is the picture of Cambrian wars, powerfully appeal to the imagination and sympathies of the reader. No subject, indeed, could be mentioned which better repays the enquiries of the learned or the curious than the earlier portions of Welsh history.

The scenery of Wales is worthy of its heartstirring associations, it comprises the beautiful and sublime to as great a degree as an equal extent of territory in any country in Europe. Lofty mountains bleak and bare; deep and verdurous valleys; babbling and meandering brooks, shaded by venerable trees beaded with moss, and "standing like Druids old with voices sad and prophetic," or like the native bards with beards that rest on their bosoms.

The scenes I am about to depict will, I hope, prove interesting to all, and be the means of causing some of my photographic brethren to visit them; and if they derive as much pleasure as I do in my rambles through the country, I shall feel amply compensated for these few hints for their guidance whilst in search of the picturesque among the romantic and delightful scenery of Wales.

Some few months ago I had the pleasure of writing a description of the Vale of Neath,* perhaps, therefore, it will not be amiss if I take the sister valley as the starting point on this occasion.

Swansea, or, as it is in Welsh, Abertawe, the most important port in the Principality, is happily situated between two hills, on the western side of the river Tawe, and has been much improved and greatly extended during the last twenty years. The first object of interest is the castle, which I am sorry to say is not so nicely situated as to be "*come-at-able*" for the gentleman of the tripod; but the following places may be selected from as giving very good views of it. The clock tower may be taken from Castle Street, or Castle Square, but the principal view, and, indeed, the most comprehensive, is to be had from the Strand; it is from here that the very elegant open parapet of arches is seen to advantage, and, although the houses in the foreground intrude themselves, still they do not look amiss, as they possess that old tumble-down appearance which harmonizes so well with the castle itself. Several excellent views of the town may also be had from the top of the tower. This castle was built by Henry Beaumont, Earl of Warwick, who, in the year 1099, came into Gower against the sons of Caradoc-ap-Iestyn, and won from them large portions of their territories; he also built several other castles, which I shall mention perhaps in some other future article. By these precautions he fortified himself in this country; and, for his further security, introduced Saxons, as the Welsh historians, ancient and modern, so inveterately denominate the English, to whom he gave lands. Of all the oppressions exercised by the Normans those of Henry Beaumont in Gower were the most intolerable.

In the year 1113, Griffith-ap-Rees, Prince of South Wales, laid siege to the castle and burned everything about it—but he could not make himself master of the fortress: from this time to the year 1648, the time that Cromwell marched here, it was the scene of many contentions, and passed through various hands. In the reign of Edward the Fourth, the heiress of William Herbert, Earl of Huntingdon, the then possessor, married Sir Charles Somerset, an ancestor of the Beaufort family, in which it is still vested.

St. Mary's church is a structure more worthy the visit of the antiquarian than the photographer, as it is built in the

* See Photographic News, No. 84, &c., Vols. iii. and iv.

worst taste of the last century; but it has several relics of the old church, which "fell down" in 1739.

The Holy Trinity church, a recent structure, in the nondescript style of architecture, makes a very pleasing picture; several very nice pictures may also be had of the interior.

The other public buildings of the town, which give pictures more or less pleasing, are as follows:—the Wesleyan chapel, the finest in Wales, should be taken from College Street. The Roman Catholic chapel, in the Gothic style, dedicated to St. David, from Rutland Street; and the Unitarian chapel, in the Tudor style, from the High Street. The "Guildhall," which stands near the docks, makes a charming picture; it was erected in 1827, and was considerably enlarged and improved in 1847. It is now the finest building in the Principality. The south-west and east fronts are rich elevations in the Corinthian order of the Palladian school.

The Royal Institution is the next object of interest, the principal front, which is of Bath stone, extends 100 feet from east to west, in the centre of which is a prostyle portico of four fluted Ionic columns, which order is continued throughout the building; it contains a large collection of antiquities, &c., which are well worth a visit; the library contains the largest collection of books relating to Wales extant. The next and last object worth photographing in the town is the new post-office, which is a very large and handsome structure. A short walk over the bridge which crosses the river Tawe, will bring you to the Danygraig Cemetery, where several very pleasing pictures may be made of the church, the chapel, and the lodge on the grounds; also a very good view of the Port Tenant Copper Works, with the entrance to the harbour and the canal. Just behind the cemetery, but at the top of Killvey Hill, there is the ruin of an old windmill, which, together with a thatched cottage near it, forms a very pleasing picture, especially if the view be taken from the north-east side, the town is seen through two apertures at the base of the hill. Again, another walk to the top of Clifton Hill, on the western side of the river, will give two admirable views of the town, also a good picture of the Grammar School, and in looking to the north-east a beautiful view of the valley, stretching far away in the distance, with the numerous works scattered here and there, give it an appearance of life and activity which adds considerably to the interest of the scene. But I must not stand gazing at this scene of beauty, when we ought to have been on our way to this El Dorado, so if my reader will now accompany me, I will lead him where nature has decked herself in the most charning robes; where rocks, woods, and glens, are gathered together, and vie with each other in attracting the admiring gaze of the delighted and enchanted tourist.

(*To be continued.*)

GLASS-HOUSES.

The following extract from a letter which has come under our notice contains so many practical hints of value on the subject of lighting, that we reprint it for the information of many of our readers, to whom we know, from their repeated enquiries on the subject, it will be interesting. The letter is from one of our first photographers in London, to an operator in the country, who was asking advice on the subject:—

Had you been in the glass-rooms of the best operators here you would have been rather struck with the diversity of their ideas. As a rule, in building a room in London, a person has little choice, but must do it the best he can, according to the accident of its situation, and the space under his control. The mode of lighting materially depends on surrounding or adjoining houses, as the local building surveyors compel us to raise our neighbours side-walls. London glass rooms therefore are mainly top light, not from choice but necessity.

The very best operator, T. R. Williams, has, what would be called by some, a very poorly lighted room, absolutely all top light, and can get no other, but he produces the best lighted pictures we see. My own room is very inferior, all top light, and not lofty enough, hence I have great trouble to get soft pictures, and to avoid violent contrasts of light and shadow. Mayall has been altering his room lately, and has made a great improvement by raising the roof, and a marked improvement has taken place since in his pictures.

Above all things, I say, have a lofty room, ten or twelve feet high, where the sitter stands, and then you may use almost direct light overhead, and yet you have it soft. Decidedly have your glass to the floor if you can, and let the sitter look at the north or north-east, your camera will then be in the south, and have a good-sized box, or screen, to keep the direct light from the lens. My opinion is, that if the sitter is in direct sunlight, or rather in the direction of direct light (say south, south-east, or west) no matter how your blinds are arranged, you cannot depend on soft pictures, and you are at the mercy of every passing cloud. In the other position, by a very little management, you can work without being annoyed with sunshine, at every period of the year and all day long.

It is a very general custom for London people to put sitters on a raised platform, but this arises from the great defect of a small top light, and the sitters have to be raised up to it to get illumination on the lower part of the figure. This raised platform I vote a great nuisance. Silvy has, I think, the best glass-room in London. It is so large that he can put the sitter anywhere, and he thus obtains such striking variety in his "carte" backgrounds, for he has lots of elegant furniture and drapery, and wherever he places them he at once gets a picture. I speak from description, I have not seen his room. H. J. C.

ON THE FADING OF PHOTOGRAPHIC PRINTS.

BY H. H. SNELLING.*

[Whilst the subject of permanent printing excites so much attention on this side of the Atlantic, it may be interesting to record the opinion which prevails amongst our photographic brethren in the United States. Mr. Snelling is one of the earliest American writers on photographic subjects, and was for many years editor of the *American Photographic and Fine Art Journal*, his remarks are made therefore with a full knowledge of the state of printing amongst American photographers. It will be gleaned from the paper that the alkaline gold toning process is not recognised as having yet had a fair trial in the States.]

In deciding any point of fact in photography, practice should take precedence of theory. I shall therefore, in this paper, confine myself entirely to the former, and from it endeavour to show wherein we fail to make permanent photographic prints.

I have no hesitation in asserting that so far as this part of photographic manipulation is concerned, we have retrograded instead of advanced, which I shall endeavour to show by presenting to the society some practical results of ten years' standing.

Particular formulas for toning and fixing are not the only causes of failure. These causes, although very many, can all be avoided. One of the most prominent of these is bad paper; because, under existing circumstances, the most difficult to guard against. Impure chemicals are another source; fixing and toning in the same room used for keeping other chemicals beside those employed for the purpose, is a grievous cause of failure, inexplicable to those who have thus suffered without investigating the subject; toning in the light by some methods; washing in impure water; inaccuracy in making the bath; insufficiency of silver in the paper, and want of care and labour in spreading it on; soaking the paper too long in the salting solution, toning bath and washing trough; and again too long and too short a time given for the final washing, are all causes of failure; these last depending more or less on the quality of the paper. I could mention two other causes, temperature and gas from the stove or grate; and yet two more, in practical use, mounting and finishing.

First, we will consider the paper. Without referring to any

* Read before the American Photographical Society, Feb. 11, 1861.

particular make, I will state the nature of papers from which we expect permanent results. Papers of coarse, loose fibre, sized with ordinary starch sized, such as when held up to the light exhibit a mottled or streaky appearance; or when passed through the salting solution, tear easily and will not bear their weight when hung up to dry, being in fact rotten; or such as are sized in the pulp. Some papers have a slight tinge of ultramarine, which is by no means beneficial—although I am not prepared to say that it is a cause of fading, I think I have detected greater tendency to spot. I have at times detected acidity in papers, the impressions on which began to fade a very few hours after drying. Papers that will not submit to a hearty rubbing, when the nitrate of silver solution is applied with the cotton brush, are unfit for photographic purposes; also those that absorb it so rapidly that it cannot be spread evenly and easily before it gets too dry. Papers silvered and allowed to turn brown and held up to the light showing greater and more dense coloration in spots are of this last character. Good paper is of a fine close-set, mixed fibre, free from cloudiness, streaks, and acidity, hard sized in the sheet with fresh size. It must not tear easily, or become spongy on soaking, and it should stand any amount of rubbing with the buckles' brush. The sizing of papers, good in other respects, may be improved by passing them through a solution of gelatine and rice water, one part of the former to two of the latter. The gelatine solution should be one grain to the ounce of water. The rice water to be made by simmering about four ounces of rice in a pint of water until it swells and cracks, after which pour off and filter the liquor and add it to the gelatine solution.

The faults of impure chemicals are, I believe, thoroughly understood by every one who practises photography, and are easily guarded against by buying of honest manufacturers only.

The toning bath should be kept in a room by itself, where it can be liable to no accidental disturbance. A few drops of sensitized collodion falling into it will start decomposition in the print while in the bath, which will ultimately destroy it; so also will solution or crystals of protosulphate of iron; and it is utterly impossible to fix a print in a bath in the same room with a bottle of sulphuret of potassium, or within reach of cyanide of potassium. I regret that I cannot illustrate all these effects by practical results, as I have not made it a point to keep samples, but I present the society with a copy of *Autumn* [marked No. 1], which is slightly under the influence of this last. In this instance the varnish seems, in a measure, to have checked the progress of decomposition, as the spots have spread very little since the picture was mounted. When sulphuret of potassium acts upon the bath, it produces a muddy yellowish appearance in the print, which decomposes it very rapidly. The iron produces a muddy brown picture. Collodion produces, after a time, yellow spots, which gradually spread to the total destruction of the print.

The decomposition produced by toning in the light is applicable only to those processes where fixing is done after toning.

In silvering the paper, to secure permanency, do not fear labour; the more rubbing it will bear, the more solid and tenacious will be the proof: and, as I said before, if the paper will not bear the necessary amount of rubbing without "fuzzing up," it is unfit for the purpose. Put on sufficient solution to cover the sheet thoroughly, and then rub it in with a buckles' brush, first by circular motion from the centre outwards, and after every part of the surface is well moistened, go over it lengthwise and crosswise, until there is not the smallest chance for the solution to run or drip, after hanging up. I present two pictures, [Nos. 2 and 3], on arrow-root paper, treated precisely alike, except in silvering—No. 3 having been rubbed until it was nearly dry; No. 2 suspended dripping. I think it is not difficult to judge of the quality or permanency of each print. I may say here that arrow-root paper gives fine, solid, clear and brilliant pictures, if printed while freshly sensitized; but if kept even four, three or two hours—according to the temperature—after drying, the results are decidedly bad: the print being dingy, weak, and confused, as in the print marked No. 4.

Soaking paper too long in the solutions, or leaving it too long in the washing-trough after printing, has the tendency to loosen its fibre and dissolve the sizing, consequently destroying the cohesion between it and the silver. If the water is impure, the impurities act more readily on the print in this state, and fading is the result. Water should be always filtered, and the print may be left in the washing-trough from six to sixteen hours, according to the hardness of size and firmness of the paper; sixteen hours should never be exceeded, and six is little enough unless sponging is resorted to. I have also found warm water, or extremely cold water, to cause fading. It should be kept as near 70° as possible. On one occasion I had twenty large proofs frozen up in my washing trough, which, when taken out after the usual time, were entirely destroyed; they had changed from beautiful dark purple prints, to yellowish, dirty-looking, abortions—flat, and the middle tints entirely gone. Many photographers advise warm water, but I have found that it invariably weakens the print, and ultimately destroys it.

The results of over-toning are too well known to require comment. It is not, however, always a cause of fading. Sufficient of the sulphuret of silver produced may be got rid of in washing to prevent the advance of decomposition, as illustrated by print No. 5. Out of a large number of these over-toned portraits, none have changed since drying, while others not carried so far have faded. This print was made over three years ago.

The influence of temperature on toning and fixing as a cause of permanency or fading is very great. The nearer the bath is kept to 70°, the better; the effects of excessive heat or cold ultimately being the same, although the print tones much more rapidly in a bath of high than low temperature. If the bath is either too cold or too warm, no amount of after-washing will prevent decomposition. It is also a very bad plan to suffer the prints to lie still in the bath, particularly when it is above 70°. If left thus to tone themselves, decomposition commences in the bath. The more they are turned over and over the better.

Coal-gas escaping into the toning room will induce sulphurisation in the print; the gas, being attracted by the moist paper and attacking the silver, leads to its ultimate decomposition. I once hung up some prints to dry over a coal stove, at the same time others from the bath were suspended in another room; the former dried yellow, and were decidedly *non est* at the end of a month, while the latter remain permanent to this day.

Mounting and varnishing, as causes of fading, may be mentioned; but so much has been written on the subject, that I will merely say a few words by way of caution. It is folly to varnish a badly-finished print in hopes to save it; the varnish itself will often destroy a picture otherwise perfect. In mounting, be careful that the cardboard is not sour, much of it is so. Gum-arabic and dextrine are unquestionably the best adhesive substances; but whatever the article employed, it must be freshly mixed, and care taken that not the slightest trace of acidity be present.

There is another cause of destruction to the photographic prints, at all events to those that are retouched, namely, tobacco. I am not prepared to say that tobacco smoke will produce fading, but I know that its juice will. Having frequently noticed a peculiar decomposition in prints retouched with India-ink and water colours, I was, for some time, unable to account for it. It at last struck me that tobacco might be the cause. We all know how prone the artist is to moisten his brush with his saliva while at work. Here I looked for the cause, and with pipe in mouth I sat down before a fine print to try, the experiment, and as I went over it with my brush alternately moistened the brush between my lips and in a cup of water, being careful to wash out all the saliva before applying it to the water. The result was, that wherever the saliva, impregnated with the tobacco smoke was placed, there decomposition set in, and gradually spread, while the other portions remained unchanged.

(To be continued.)

Proceedings of Societies.

Newcastle-upon Tyne and North of England Photographic Society.

The monthly meeting of this society was held in the Tower, New Bridge Street, on Friday evening, the 5th instant. G. C. Warren, Esq., in the chair.

The Chairman said, that since their last meeting the council, through their secretary, had communicated with Mr. Moule, the patentee of the photogen, for the purpose of having one sent down to exhibit to them at this meeting. A letter from Mr. Moule had been received, intimating his readiness to comply with the council's wish, and also stating that one would be despatched in a few days. Through some oversight in the hurry of business this must have been overlooked by Mr. Moule; but that he had no doubt that, on another communication being sent, it would be forthcoming at the next meeting. He also announced the election of Roger Fenton, Esq., and Lake Price, Esq., as members of the society.

Mr. McKie then drew attention to the tannin process, with which were presently engaged many of our ablest photographers. He gave it as described by some of its warmest advocates. Though unsuccessful in the most of his own experiments, he attributed the cause of failure to the unsuitableness of the collodion he had used. He had been supplied with some by his friend Mr. Laws. With it he had had much better results.

The Chairman.—What kind of collodion did you use, and what was the character of the film?

Mr. McKie.—The first was an ethereal collodion, the film was hard and tough, and split up in the centre during development; the other was alcoholic, which remained on the glass, but had a tendency to break away at the edges.

Mr. Dewar said, that he had prepared several plates with the tannin preservative, but that in no instance had he been able to finish one, some film cracked during development, and others the film left the plate in drying.

The Chairman.—The splitting of the film during drying would be owing chiefly to the nature of the gun-cotton.

Mr. Laws exhibited two negatives he had taken by the tannin process. They were the only two he had prepared. With both he had been successful. The edges of the plates were varnished with varnish. The negatives were handed round, and considered very satisfactory. Mr. Laws remarked that, although he had been so far successful, he, as a professional was still inclined to the wet process for certainty of result.

Mr. North also advocated the wet process in preference to any dry method.

Mr. McKie thought that, although the wet process might be considered preferable by professionals, he, as an amateur, considered that any good dry process would be a boon to such as himself.

The Chairman coincided in this remark.

Mr. Porteus spoke highly of alcoholic collodion for the tannin process. He had experimented with four different kinds, one by a local manufacturer, another by a manufacturer in the south, and two by Mr. Sutton. Mr. Sutton's alcoholic collodion alone gave good results.

The Chairman stated he had seen several specimens of the collodio-albumen process by a gentleman at Darlington, whose confidence in that process was such that he could guarantee the certainty of his plates; he, the Chairman, considered that the slower the process the greater the certainty. If suitable collodion were used and the tannin process sure, it would matter little whether it took an exposure of 1 or 3 minutes, as far as time was concerned. The general fault in landscape pictures was the want of full exposure. Mr. Laws then exhibited a tent of his own manufacture. The whole of the tent was enclosed in a box about 2½ feet by 1 foot 6 inches, and 4 inches deep. The bottom of the box formed a water-tight tray, which was fixed to a tripod stand, upright bars of deal were raised at each corner, which supported the lid of the box forming the top of the tent. Over the whole was thrown the tent cloth, which contained pockets for bottles, &c., light was admitted through yellow cloth. The waste water was carried off by a tube screwed to the bottom of the tray. In working in this tent the operator stood upright; the advantages of this tent were its simplicity, lightness and portability; the tent was well examined, and much admired by the members.

Mr. Hill, of North Shields, introduced to the notice of the members a stereoscopic camera combining several improvements which he had introduced. The camera displayed considerable mechanical ingenuity.

A large number of very fine stereoscopic pictures by several well known artists, were exhibited by Mr. Bunn. Many large pictures were also shown by the members.

Messrs. Wood, Burney, and Brockett were then elected members of the society.

The Chairman announced that Mr. Laws had kindly consented to read a paper at the next meeting "On the Printing of Transparencies."

A vote of thanks was unanimously given to Mr. McKie for his paper, and to Messrs Laws, Hill, and Bunn, for the exhibitions of the tent, camera and pictures, also and to the chairman. The meeting then adjourned to Friday the 3rd of May.

Photographic Society of Scotland.

The sixth meeting of the fifth session of this society was held on Tuesday night in George Street Hall.

The chair was occupied by Sir David Brewster, President of the society.

There was a numerous attendance of members, and the walls of the Hall were decorated with the pictures of Messrs. Claudet, Maxwell Lyte, and Robinson, removed from the Society's Exhibition just closed. A part of the proceedings of the evening being the presentation to these gentlemen of the medals awarded them. Mr. Lyte and Mr. Robinson were unable to attend the meeting; but Mr. Claudet paid a visit to Edinburgh for the purpose, and was cordially received by the society. In presenting him with his medal, Sir David Brewster brought under the notice of the society the numerous inventions and discoveries in photography, for which they were indebted to Mr. Claudet. Talent of research was seldom, he said, combined with mechanical skill in manipulation; but both these were possessed by Mr. Claudet, to whom had been awarded the society's medal for the best portrait in the late Exhibition. He would briefly lay before them some of Mr. Claudet's inventions and discoveries. Among these were the increasing the sensitiveness of the original daguerreotype plate by the use of chloride of iodine, so that the time requisite for taking a portrait in the camera was reduced from ten minutes to a few seconds. This discovery he made in 1841. He had also perfected the image in the camera by his investigations in the achromatism of lenses. And in order to test the exact difference between the visual and chemical foci, he had invented the focimeter. He also had invented another instrument for measuring the intensity of object-glasses; and, in 1843, he had communicated to the Royal Society a valuable paper on the stereoscope. In 1857, he had communicated a paper on the phenomenon of relief in the image formed on the ground-glass of the camera, and founded on this an instrument which he called the stereomonoscope.

The Chairman then alluded to many important communications on matters relating to photography, which Mr. Claudet had made to various societies, and concluded by expressing the pleasure which he had in presenting him, on behalf of the society, with their silver medal, for the best portrait in their recent Exhibition.

Mr. Claudet having acknowledged the compliment paid him,—

An interesting communication was read by Mr. Cramb, of Glasgow, on the albumen process, in which he detailed the modifications which he had found most successful, and exhibited a number of specimens which were much admired.

Mr. Tunny, in a few remarks, proposed a vote of thanks to Mr. Cramb; and, after the usual compliment to the Chairman, the meeting adjourned.

We understand that Mr. Claudet was entertainted at dinner on Wednesday evening by the council of the society.

Photographic Notes and Queries.

Halation.

Sir,—Your theory as to the cause of this phenomenon, though ingenious, does not seem to me altogether satisfactory. Why the mere contact of free nitrate of silver, which cannot be reduced directly by the developer, with particles of silver in the act of reduction, should be sufficient to cause the reduction of the former, is not quite clear. Moreover, if the free nitrate on the dark parts is actually "*swept*" by the developer on to the light parts, as you suggest, surely this *sweeping* would often be in one direction only, whereas the effect described is always equally distinct all round.

Are there any objections to the following supposition? A considerable portion of the rays falling on the lens from a bright point is, of course, scattered in all directions. Some rays are scattered through the lens, and of these, possibly, many are not much deflected from the true course of the properly refracted rays. If this be the case, what is called Halation would undoubtedly take place.—I am, sir, your obedient servant, Reflector.

[The theory we put forward was simply offered for consideration, and we still think the cause specified acts as we indicated. We think it possible, however, as we before stated, that a variety of causes produce results more or less similar. Our correspondent's theory may be true of some cases, but we do not think it is the explanation of halation proper.—Ed.]

Sir,—I cannot believe that your theory of halation is the correct one, and I think the following simple experiment would prove it to be erroneous.

Let a photograph be taken of a subject liable to give rise to the fault in question, and let the developer be poured on, always on one end of the plate, and run off at the other. Then if your theory be correct, the edge of the subject nearest the point where the developer is applied should be free from mistiness; for to it there would be no flow of nitrate from the image, but the edge furthest away would alone suffer, since from it the nitrate would flow partially decomposed from contagion with the nitrate acted on by the light.

Now this, I think, would not be the case, but the halo would be perceptible on both sides alike.

The appearance of the phenomenon would suggest that it arose from the same cause which makes the sun appear blurred and indistinct to the eye when a candle gives a clear and defined image.

Does not Mr. Malone confuse fogging with halation?—Yours, &c., F.

[It is simply because we have most frequently observed the halation in the direction of the flow of the developer that we are confirmed in our opinion of the cause. We think Mr. Malone is too old a photographer and too acute an observer to confound halation with fogging.—Ed.]

Stereo Exchange Club.

Dear Sir,—I have been in the Stereoscopic Exchange Club since the second list of same was published, and though I have received some of the worst stereograms I ever saw, yet on the whole I am immensely pleased with it, for the majority of pictures are as good as my own, and some, very much better. So one good lot makes up for several bad ones.

My object in troubling you to-day is, to impress upon you the necessity of immediately publishing a new list of names. I think that all old members who wish to continue in the Club. should send in their names to be put in the new list; but I do not see the necessity for them to forward you specimens a second time. The latter point could be left for you to decide. The reason why I recommend the plan I have mentioned is, that I have sent stereograms to many of the old members from whom I have received no reply whatever (I now refer to the members on the oldest list), while some have returned my stereograms, saying they have retired from the Exchange Club, others have left the country, and so on.

As the printing season is now advancing, it would be a good time to publish a new list: and if you think that old members should send in their specimen prints again, I shall be the first to do so.

Trusting you will give notice in your next impression of a new list, and thanking you for the trouble you have taken in forming so enjoyable an association as the Stereo Exchange Club, I am, dear sir, yours truly, Isaac Hollis, jun.

In my letter I have given no names, but can do so if desired.

[We shall have pleasure in publishing a new list of names, if those gentlemen desirous of being included will communicate with us.—Ed.]

Cheap Printing.

Sir,—In your impression of April 5th, you answer a correspondent thus, "*For printing card portraits about one shilling a dozen is, we believe, a common price.*"

Now if such is the case, we may depend upon it, there is something common, very common, to be obtained in return.

The above remark coming from such an authority as yourself, is, unquestionebly calculated to prejudice the interests of photographic printers of integrity, unless they receive your support in return.

As an old photographer, and one well versed in the difficulties and annoyances in connection with printing for the profession, I say emphatically (and all good men and true will coincide with me) that *no one* can print upon such terms, and do justice to themselves and those that employ them.

By way of caution to those persons fond of making the "market penny," I hand you the following sketch.

Some time ago, a certain publisher having negatives of popular interest, gave them to a *remarkably cheap printer*, and in due time received the copies from them. When canvassing the dealers to purchase his goods, what was his dismay to behold his own subjects in the market, and selling at a price less than he could supply them for!

This, sir, is my simple story; if you can afford space, I trust you will give it a place in your pages; for whilst you are ever ready to give advice to those asking for information, I feel confident you will as readily uphold the interests of those who earn their bread and butter by the sun. I am, sir, yours respectfully, A Printer's Devil.

London, April 10th, 1861.

[Our correspondent only does us justice in crediting us with the desire to maintain fair prices in every department of photography. We believe that a tendency to miscalled cheapness in every branch, has been the bane of the art, and the ruin of the profession. Low-priced lenses, low-priced cameras, low-priced chemicals, low-priced pictures, are all monstrous mistakes. We quoted the price on the authority of one well versed in the matter, but we may have misunderstood him. These are things that, without direct inquiry, we cannot know, as we are not engaged commercially in photographic printing. We will inquire further. Ed.]

Strengthening Negatives.

Mr. Brothers writes to say that the formula for strengthening negatives given in his letter last week may mislead from being stated in grains. It should have been stated in ounces, thus:

Bichloride of mercury	1 oz.
Hydrochlorate of ammonia	1 oz.
Water	20 oz.

The issue is the same; but the above quantities are most suitable for preparing at once.

Transferring Positives.

Dear Sir,—Allow me to correct an error in the recipe for transferring positives to paper, which you kindly inserted at page 371, No. 117, of the Photographic News. I cannot at this moment recollect whether I made the mistake in writing out the recipe, most probably I did.

In No. 117, it stands—		It ought to be—	
Borax ...	... 1 drachm	Borax ...	... 1 drachm
Shellac ...	... 1 drachm	Shellac	... 4 drachms
Water ...	... 5 ounces	Water ...	... 1 ounce

I am, dear sir, yours faithfully,

H. R. Spearman, 91st Regt.

Kamptee, India, Feb. 18, 1861.

Correspondence.

FOREIGN SCIENCE.

[from our special correspondent.]

Paris, 10th April, 1861.

The "Paraffine Process," which made a stir some time ago, and which seems so have fallen into unmerited neglect, has found an advocate in M. Civiale, one of our most eminent photographers. At the last meeting of our Society, this gentleman exhibited two proofs, positives obtained from negatives on paper prepared with paraffine. This substance is found to be very efficacious; the paper prepared with it is perfectly white and transparent, and prints rapidly. The same baths as are employed for ordinary waxed-paper, answer for that prepared with paraffine. The only modifications required are to place the paper, after exposure in the camera, on the sensitizing bath of aceto-nitrate of silver, before immersion in the gallic acid. The time of exposure is about the same as that required for wet collodion.

Our Photographic Society appointed a committee to examine and report upon M. Fargier's carbon process, the details of which I gave you in my last. The committee consisted of MM. Aguado, Bayard, Davanne and Girard, names well known to you. All the details of the process were gone into in their presence, and although the day was rainy, and other unfavourable circumstances interfered with the operations, yet the results were perfectly successful, and satisfactory to the committee. M. Davanne remarks that the only difficulty in the process arises at the moment when the layer of collodion floats in the water, and is to be transferred to the gelatine paper. But he is of opinion that a very little practice will render this feature easy of execution. Placing a glass plate at the bottom of the dish, if the latter be uneven, will facilitate the operation by lifting it under the gelatine paper until the latter meets the collodion film.

The introduction of life-sized portraits, consequent upon the use of the solar camera, creates a demand upon the photographers' ingenuity to provide a means of preparing the paper which is required to be of such unusual dimensions. It is obvious that all our old appliances are inadequate to the purposes of salting and sensitizing. Mr. Henry Romberg has constructed an apparatus for preparing these large sheets of paper, which I will endeavour to describe to you. First, a frame is constructed, say six or seven feet in height, fitted into a broad base, so that it will stand alone; this is fitted with two varnished wooden cylindrical rollers, one near the top of the frame, and adjustable, the other near the bottom, but just above a trough containing the salting or sensitizing solution, which is easily removable. This lower cylinder is furnished with a crank handle. The sheet of paper is passed over the rollers, and then the two ends are fastened together with some insoluble glue, so as to form an endless web. The solution must fill the trough, but, for the salting and silvering operations, the lower cylinder must be so arranged that the *surface* of the paper only passes over the solution. For the other solutions, and for washing the cylinders will, of course require to be changed. By turning the crank of the lower cylinder the sheet of paper revolves, and every part of it passes successively over the surface of the solution, or into it if required. The quantity of solution necessary is reduced to a minimum, and all risk of bubbles on the surface is avoided. Arrangements must be made to keep the solutions in the trough at the same level, but this, and all other conditions necessary to successful operations, will suggest themselves to any ingenious person.

A fact throwing considerable light on the propagation of contagious miasma has recently been made by Dr. Eiselt, of Prague. In the Foundling Hospital at Repy, out of 250 children, between the ages of 6 and 10 years, 92 cases of blennorrhœa of the ocular conjunctiva occurred. This epidemic ophthalmia fully convinced Dr. Eiselt that the contagion was transmitted by other means than by contact. The doctor ordered the nurses to carefully avoid touching the eyes of the afflicted children, and he was no less careful himself; but, notwithstanding every precaution, both the doctor and the nurses were attacked with the disease. Dr. Eiselt then thought of examining the atmosphere of one of the wards of the hospital containing many patients, by means of M. Pouchet's æroscope, and in the first portion of air that passed into the instrument he distinctly recognised small pus cells, which certainly served as vehicles of contagion. The great importance of this discovery has induced many eminent physicians to unite in the investigation of the subject, from which important results may be anticipated.

M. Babinet has made a very original and interesting communication upon a particular point in the physics of the earth; the secular variations in the saltness of the seas; and the possibility of acclimatizing in fresh-water lakes animals which it has been supposed could live only in salt or sea-water. Originally, the waters of the ocean were much salter than they are at present, their saltness has progressively diminished, and this continual diminution is caused principally by the fresh-water brought down by rivers and streams. The degree of saltness of the Black Sea is now expressed by the number 14, one half the number, 28, which corresponds to the ocean. Other seas are even much less salt. The waters of inland seas generally, which are not in direct communication with the ocean, and which continually receive the water of rivers and streams, are very slightly salted. The Mediterranean Sea, on the contrary, to which an inferior current brings continually, by the Straits of Gibraltar, a supply of water from the Atlantic Ocean, has almost preserved its original saltness. Certain internal seas, or great lakes, also, formerly communicating with the ocean, but which have been separated from it by upheaval of earth, have lost their saltness. Lake Baikal, for instance, formerly a salt lake, is now full of fresh water. As the saltness disappeared but slowly, marine animals and plants have passed gradually through successive generations, from a regime of salt to a regime of fresh water, undergoing a complete acclimation. Thus, in Lake Baikal there are found four large species of marine creatures: 1st, herrings in great quantity, which are salted and dried, and exported to distant places; 2nd, seals, exactly like those of the North Seas; 3rd, sponges, whose natural country is the warm and salt water of certain seas; lastly, coral, which we are accustomed to seek only in the waters of the Mediterranean. These premises established, M. Babinet arrives at his principal theme. Since the herring, the seal, sponges, and coral live acclimated in the fresh waters of Lake Baikal, why can they not be introduced, and made to thrive, in the lakes of Savoy, Switzerland, Enghien, the Bois de Boulogne, &c. Nothing could be more easy at the present day than to convey a supply by railway from Russia, at first from Lake Baikal, or other similar lakes of Eastern or Southern Russia.

ART TEACHING FOR PHOTOGRAPHERS.

Dear Sir,—I remember how puzzled and disheartened I once was when after repeatedly shouting some information into the ear of a dear, old, deaf friend of mine, he replied to each such attempt with "Oh, yes, that's all very true; but, you see, what I want to know is,—" and then proceeding to repeat over again the very query I had just answered. I must confess that I experienced very similar feelings when I read the letter from "One in Search of Art Knowledge." Here was poor I, fondly flattering myself that I had been particularly explicit and practical, saying, now and then, after carefully re-reading some article I had just written, "yes, I think that must be easily understood;" and *there* was a sensible, and seemingly earnest, student of photographic art reading, as it appears, all I wrote without at all understanding its drift or meaning.

The following works will be found useful to "One in Search of Art Knowledge:"—Ruskin's "Elements of Drawing," Frank Howard's "Sketcher's Manual," Sir J. Reynold's "Discourses," Windsor and Newton's shilling series of Handbooks, and Burnet on "Composition;" but all these works being written more particularly for the painter, very much that is useless and uninteresting to the photographer will be found in them.

I must own that this fact is somewhat humiliating, but as I am anxious only to be of real use to my readers, will "One in Search of Art Knowledge" favour me by pointing out in what way I can be more practically useful to himself and others.—I am, dear sir, yours, &c., A. H. Wall.

28, *Old Bond Street, W.*

Artificial Silver.—Some years ago Mr. R. W. Fox, of Falmouth, astonished the scientific world by shewing specimens of artificial copper produced by electricity! We now hear of a German chemist who produces silver, sterling silver, not German, by artificial means, at a cost of about three shillings an ounce. We hear moreover that a snug company is forming to work the discovery on a profitable scale: the appliances required are certain chemical preparations, and galvanic apparatus of sufficient power to act on them. Should the experiment succeed on the large scale the profit will certainly be handsome, and additional weight will attach to the opinion, that all metals are resolvable into two or three elements.—*Chambers' Edinburgh Journal.*

Talk in the Studio.

Photography on the Railway.—The *Scientific American* states, that on the Chicago and Milwaukie Railway a very beautiful application of the photographic art is used on the "season passes" and "commutation tickets" to prevent their illegal transfer. When a person applies for a season pass or ticket, he incloses his photograph taken on a small gummed label, and this is pasted on the card which he receives. The conductor of the train can thus see at a glance whether the bearer of a pass or ticket carries the evidence of "the right man being in the right place."

Gigantic Negatives.—The *American Journal of Photography* states that Mr. Whipple, of Boston, has been taking glass negatives five feet by four feet in size.

Photographic Enamels on Glass.—The *Athenæum*, speaking of Mr. Joubert's method of enamelling, says:—By this process we have before us several examples of admirable and perfect transfers of elaborate views of natural localities indelibly fixed on to the glass itself,—defying time and weather, if fixed in the open air,—which may be cleaned as readily as a common window-pane,—do not interfere with the transmission of light to any marked degree,—whilst employed as such, they effectually serve the purpose of shutting out disagreeable views,—miseries we are subject to in London, in such situations as staircase-windows and the like. Fixed in the sashes of a library, these ornaments would give a great repose and exclude external sights; and, judiciously selected by the inhabitant, might fitly sustain the character of the apartment, by presenting views of famous localities or portraits of famous men. What an imperishable gallery of friends' likenesses might not a man gather upon his window-panes! what elegant and appropriate fittings for the glass shelves of his choice book-case! No doubt this process may be as admirably applied to other purposes; but, as it is, the power of getting a photograph of one's own transferred to glass for a trifle, and without risk, is really an enviable one. By the side of the hall-door, how much better these than the poor, common-place ground-glass, or even the etched glass that is now so much in vogue! How applicable to a summer-house, or the lower panes of a conservatory these may be, we need not say.

Photographing State Documents.—Mr. Gladstone, a short time ago, consulted Sir Henry James on the possibility of copying out ancient records by means of his process of photozincography. A small deed of the date of Edward the First was copied and printed, with so much success, and at so trifling an expense, that Lord Herbert of Lea, the Secretary-at-War, ordered the impressions to be bound up with the yearly report on the Ordnance Survey. Thus encouraged, Sir Henry James got permission from the Lords of the Treasury to copy that part of the Domesday Book which relates to Cornwall, as an experiment. He has now achieved this commission, with a result which should certainly encourage the further prosecution of the design, county by county, as appears to have been originally proposed by him. Those who care to have no more of Domesday Book on their shelves than relates to their own shire, can buy the local part. Those who wish to have the whole can bind the several parts into volumes. The work is to be published at cost price, or nearly so.—*Athenæum*.

Abundance of Silver.—*Chemicus*, and another correspondent writing to the *Times*, state that the recent discovery of oxide of silver in a natural state, a thing which, until recently, was believed not to exist, will produce a yield of silver absolutely enormous in relation to that which has hitherto been obtained from the ordinary metallic silver deposits. In a ton of ore, in its natural state, where the normal yield would be 13 ounces, the new discovery will produce an average yield of 113 ounces, the 100 ounces being produced from what has hitherto been regarded as useless. The importance to our mines, where silver is often found near to copper and other metals, will be very great; and in some cases, where the deposit is great and unmixed with other metals, the returns will be almost fabulous, while the cost of working will be absolutely trifling.

Advertisements and Communications for the Publisher for the current number, to be addressed to the Office, 32 Paternoster Row, not later than 3 o'clock every Thursday. Post-Office Orders are to be made payable to Mr. Thomas Piper, at the Money-Order Office, St. Martin's-le-Grand.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32 Paternoster-Row.

To Correspondents.

TO AGENTS AND SUBSCRIBERS.

The proprietors of the Photographic News will esteem it a favour if agents or subscribers who may have copies of the following back numbers of the News which they can spare will forward them to the office, 32 Paternoster Row, for which they will receive cash or copies of the current number. The numbers required are: 6, 9, 24, 26, 30, 40, 41, 49. Single copies will be valuable.

J. H.—Use protosulphate of iron as a developer, if you want silvery whites in your glass positives. We do not like the effect of sulphuric acid in the developer, so far as we have tried it. About half-a-minim or a minim of nitric acid is sometimes an improvement. Cyanide is better for fixing positives than hypo, a purer whiter tone being produced.

K. C.—Becoming a private pupil of Mr. Sutton, at King's College will be most likely to meet your wants. You will then not only have first-rate theoretical and practical tuition, but you will also have regular access to an excellent laboratory for practice.

Inquirer.—The word superposition is used in relation to transparencies in contradistinction to camera-printing. It means that a negative is placed upon a dry sensitive plate and exposed to light as in ordinary printing. In camera-printing the wet process is used. The negative is placed in a cell or groove at a proper distance from the camera and lens and the light made to pass through the negative to the lens so as to form an image on the ground glass. The use of two cameras is an excellent and simple plan of camera printing. The lens in one camera is placed with the hood through the aperture in the front of the other, from which the lens has been removed. The negative is then placed in the groove in place of the ground glass of one, and the image is focussed on the ground glass of the other. The operations then are all in the usual way.

J. H.—There are various houses who supply the photographic scraps and wafers, but the only one we can recall at this moment is Ayling, New Oxford Street. For the wholesale supply of card portraits, Marion, Regent Street; McLean and Melhuish, Haymarket; and others.

R. N.—To enlarge a picture 6 in. by 4 in. to 14 by 12 in. with a lens of 4 in. focus, the negative must be placed about 5½ inches from the lens, and the camera extended about 14 inches. We speak in round numbers, but you will perceive, as the enlargement is in linear proportion, a 6 by 4 negative could not be enlarged to just 14 by 12, neither more nor less, as the relation of 6 to 4 is very different from that of 14 to 12. As you will have to enlarge at two operations, in the first of which you will obtain a transparent positive, do not attempt to take this on waxed paper as you propose, as a waxed paper picture is altogether unsuitable for printing by transmitted light in the camera. Take the transparent positive on collodion, and from that you can take a negative on waxed paper. The necessary amount of exposure must in all cases be ascertained by experience, as so many circumstances will affect the question. You will find a table of distances for enlargement in the Photographic Almanac. There is a good deal of information on the subject scattered over the pages of the News, we may mention particularly at p. 189, vol. 1, (No. 15); p. 111 and p. 158 vol. 4, (Nos. 96 and 99).

J. C. B——d should let us have his address that we may be in a position to communicate with him if necessary.

M. M.—The spots you describe are probably sulphur spots. A correspondent the other day sent us a glass positive covered with small black spots, which, on examination, proved to be sulphide of silver. A very common source is the using of a vulcanized india-rubber blower for removing the superfluous colour in tinting.

Focus.—A view lens should never be used with the full aperture.

X. Y.—If you tone with acid chloride of gold, and place the print unwashed in hypo, you will undoubtedly get more or less of sulphur toning as well.

X. Y, Z.—We prefer the binocular stereoscopic camera for our own use for a variety of reasons. No. V1 decidedly. If you send us your address, we can give you fuller information.

J. B., Aberdeen.—We have not personally tried either of the lenses you name, but have seen good work done by both. We will make some further inquiry, and let you know.

Noaval.—Acklands "How to take stereoscopic pictures," published by Horne and Thornthwaite, will give you information as regards the use of a single-lens camera; the use of the bi-lens camera does not need explanation. Two thicknesses of good yellow calico may serve for a tent if it be not placed in direct sunlight. A good deal depends on the quality of the calico. Many tents are made of two thicknesses of yellow calico and one of black, leaving about a foot square of the yellow only, as a window. Volumes 3 and 4 of the Photographic News are to be had, price 10s. 6d. per vol. Vols. 1 and 2 are out of print.

A. G.—The "white" of eggs is always of a yellow tint, and is deeper in the eggs of some fowls than others. The extremely attenuated layer on albumenized paper, does not perceptibly affect the colour. It is not necessary to decolourise it. In some experiments, some time ago, to increase the limpidity of the albumen, we first added ammonia, and then hydrochloric acid, to form the hydrochlorate of ammonia in that way. This made it limpid as water, but changed the colour to a deep brown. We did not observe that this colour was apparent on the prepared paper.

Sul.—The spots on your positive were undoubtedly from sulphur. We think the vulcanized india-rubber blower the most likely source. Abandon its use for one unvulcanized, and try.

A. B.—The practice of using collodion with seven parts of ether and one of alcohol, is very little followed now. Equal parts of each are very convenient. For negatives we prefer at least 5 grains of soluble cotton to the ounce.

Edward L.—We have used the bellows form of camera for many years, and find no fault of any kind with it. There are other forms of bellows cameras besides Kinnear's, you will find them described in trade catalogues.

B.—The Exhibition of the Photographic Society is closed.

C. F.—Various articles in the Taupenot process have appeared in the News, but another will appear shortly.

D. O. F.—Prints on albumenized paper are suitable for colouring in oil. They require preparing with a coating of gelatine or isinglass, to prevent the oil sinking into the paper, and thus drying or "bearing out" irregularly

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 137.—April 19, 1861.

A HINT ON THE METHOD OF DEVELOPMENT.

There is an important hint contained in Mr. Vernon Heath's excellent paper on working wet collodion in the field, which appeared in our pages a fortnight ago, to which we think it desirable to call especial attention.

All photographers are familiar with the fact that one of the troubles in working large plates successfully, arises out of the difficulty at times experienced in getting the developer to flow over the plate in one sweep, without any stoppage or tendency to run in greasy lines; and that unless the plate be so covered at once, stains and lines on the negative are the inevitable result, from irregular development. Mr. Heath's method entirely obviates this difficulty: instead of applying the developing solution direct to the film after exposure, he applies first sufficient distilled water to cover the plate; and after allowing it to flow backwards and forwards a few times, returns it to the developing cup, and there adds a portion of developing solution which he then applies to the plate. After bringing out the details with this dilute developer, he proceeds to obtain sufficient intensity by means of a stronger solution.

Mr. Heath's especial object in using this method is to obtain an amount of detail and softness by the slow and gradual development, not to be acquired by a more rapid and sudden reduction. He also remarks that in hot weather a great advantage is obtained in the development being quite under control.

As we have remarked, there is another advantage, to which Mr. Heath has not adverted, the entire immunity from stains caused by the irregular flow of the developer. In the use of iron as a negative developer, this advantage will be of great importance, as an almost insuperable difficulty in using it for large plates has arisen out of the difficulty in getting the plate covered with sufficient rapidity and evenness to prevent irregular development, without a very weak iron solution and full amount of acid. On adopting this method, however, all difficulties of this kind vanish. It is only necessary to have a solution of iron of, say, double the strength intended to be used; and instead of applying it at once, first cover the plate with distilled water, letting it flow backwards and forwards until it is all thoroughly mingled with the free nitrate, and there are no more greasy lines; pour it back into the developing cup, and add to it an equal measure of the strong iron solution, which may then be applied to the plate without danger of any irregularity or stoppage in its flow, or consequent stains or markings in the development. No fear need be entertained of any immediate reduction on mixing the iron developer with the dilute nitrate of silver solution which has been poured off the plate. If the iron solution contain an average amount of acid, whether acetic acid or citric acid be used, and the nitrate bath be in anything like a good working condition, no immediate decomposition takes place on adding the iron solution to the dilute silver solution. We have tried this method with complete success, a gradual, delicate, and perfectly clean development being the legitimate result. No alcohol need, of course, be added to the developing solution, as its only office being to aid in the ready flow of the solution. it is not only not needed here, but would be positively injurious.

SUBSTITUTE FOR NITRATE OF SILVER.

Some few months ago the somewhat startling announcement was made in the French scientific journals, and translated from thence into our own and some other English journals, that a substitute for nitrate of silver had been discovered, and named Photographic Ink "*Encre Photographique; remplaçant le bain d'argent.*" Certainty of execution, permanency of result, and a large economy in cost were the attractive recommendations which distinguished this "compound salt." These and other advantages guaranteed by the avowed conviction of eminent men of science such as the Abbe Moigne, and of first-rate practical photographers like Disderi, were sufficient to arouse the interest of others besides the scientific *gobemouche*, and arrest the attention of the most incredulous. The new product was at once patented both in France and other countries, and in France a "*Société des Encres Photographiques*" was established for its manufacture and sale.

Unfortunately, however, trial of this substitute did not fulfil the hopes held out, and analysis seemed to indicate that the "ink" simply consisted of adulterated nitrate of silver. The specification of the patent—which has not been completed, the invention having only received provisional protection—has recently been published, and from it we learn that the "substitute for nitrate of silver" replaces that salt much in the same way that sand is said sometimes in the hands of the dishonest grocer to replace sugar, sloe-leaves to replace tea, and chicory to replace coffee; in short that the invention simply consists in an adulteration of the nitrate of silver. Here is the specification:—

"I Louis Cyrus Macaire, of Paris, in the Empire of France, Artist, do hereby declare the nature of the said Invention for 'A Substitute for Nitrate of Silver, particularly applicable to Photographic Purposes,' to be as follows:—

"In forming my substitute for nitrate of silver, I propose using, in combination with the pure silver and nitric acid now employed, certain quantities of azotate of potash and a small portion of a baser metal, such as copper, tin, zinc, or bismuth. These materials mixed in the proportions below mentioned I have found to answer well:—

Pure silver	... ...	1·
Nitric acid	... ...	1·50
Azotate of potash	...	1·50
Zinc or other metal	...	·1
This combination producing		4·1."

Voila tout!

"INSTANTANEOUS PHOTOGRAPHY, WITHOUT COLLODION, WITHOUT NITRATE OF SILVER, AND WITHOUT DEVELOPMENT."

The very excellent journal recently established by Herr Liesegang and M. Lacan, *Le Moniteur de la Photographie*, contains in the review of the month, in the last number, the announcement we have quoted above; and we see that M. Lacan, in his interesting letter to our Liverpool contemporary, repeats the paragraph to which this announcement refers. He states that a good deal of attention has recently been given in Paris to the process published in England by Mr. Bellini, in which a mixture of shellac and gum sandrach in ether and alcohol, to which are added iodide, bromide, and lactate of silver, and also iodide of iron, is stated to give an almost instantaneous picture without development.

Now as the announcement of such a process was originally published in our pages, some six months ago, under the head, "Startling Announcement," we feel bound to tell what we know on the subject, lest, appearing with such respectable indorsement, some readers of the *Moniteur* or *British Journal* may be misled by it.

We found at our office on a Thursday in September of last year, a few hours before going to press, a letter from Mr. Bellini making the announcement already referred to. The statements were startling; but so was photography itself a few years ago: we resolved, however, before inserting it, to see the writer of the letter. We did so; but it was evening, and there was no opportunity for verification of the statements; but we were shown a number of specimens, which looked uncommonly like collodion positives, but which were stated to be the result of this process. We were invited to see a picture taken by the process at our earliest convenience; but in the meantime urged to insert the letter, to establish priority of discovery at once. As the gentleman, who was entirely unknown to us, seemed to make his assertions in perfect good faith, we inserted the letter, which will be found in the 250th page of our fourth volume, and added at the same time that our readers must take it for what it was worth.

We called repeatedly on Mr. Bellini to witness his process in operation; but on each occasion something was wrong. The chemist had supplied him with the wrong article; the preparation was too newly mixed; the light was not suitable,—in short, we never saw anything done. Once or twice an attempt was made, but no result worth mentioning followed; and we finally lost sight of Mr. Bellini, who changed his address.

If any of our French brethren have succeeded better we shall be glad to hear of it; but we feel bound to mention these particulars in order that those photographers who are what Mr. Thomas once described as "afflicted with an experimental turn of mind," may know exactly what grounds they have for further investigation.

THIRD REPORT OF THE EXPERIMENTAL COMMITTEE OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

In this report the Committee do not aim at exhausting the subject of dry plate photography. They propose only to report on those which they consider available for general out-door photography.

During the coming season it is their intention practically to test these different processes, one against the other, to a greater extent than the nature of the weather has hitherto enabled them. In the mean time they place before the Society the result of their investigations so far in the several processes following.

The Taupenot; or, Original Collodio-Albumen Process.

This process, on the whole, is considered an exceedingly satisfactory one, although there are certain difficulties attending it, which will ever prevent its becoming a general favorite with the amateur.

Particulars of Manipulation.—Sensitize in the ordinary manner, using any collodion, provided it is not too thick, and *thoroughly* wash under a stream of running water. It is not necessary to use distilled water for this purpose. Iodized albumen is now to be poured over the washed collodion surface. This albumen is prepared as follows:—

Albumen	1 ounce
Water	¼ „
Iodide of potassium...	5 grains
Bromide of potassium	1 „
Ammonia	10 minims

Dissolve the iodide and bromide in the water, then add the ammonia. Mix altogether with the albumen, and beat the whole into a froth and allow to settle, when the clear portion may be poured into a stock-bottle for use.

Air bubbles must be carefully avoided, and the excess of the portion of albumen taken from each plate should not be returned to the stock-bottle, but placed in a separate receptacle for future use. It should not, however, be used more than two or three times, as after that it becomes too dilute. Allow the plate to drain on one corner five or ten minutes; then dry rapidly before a clear bright fire, and make it quite hot. This tends to prevent blistering in development.

In this state the plates are insensitive to light, and may be kept for years. This keeping quality is very convenient, as it enables the photographer to prepare, during the winter months, a stock for the summer season.

To sensitize these plates, immerse them in aceto-nitrate of silver, prepared as follows:—

Nitrate of silver	40 grains
Acetic acid	½ drachm
Water	1 ounce

and again thoroughly wash. The amount of washing, however great, seems to lessen the sensitiveness, but adds to its keeping qualities.

Development is best effected with gallic acid. Place it, face upwards, in a dish, with sufficient of a saturated solution of the gallic acid to cover it. When it has remained five or ten minutes, add a few drops of silver solution, and mix well in the dish; the picture will gradually appear. When all the details are out, add more silver till the development is complete. Fix in hyposulphite of soda.

The above method of manipulating is that followed by Mr. Mudd. Your presentation print of this year is a proof that in such hands as his the process leaves but little to be desired.

Those members of the Committee who have given the process a fair trial are of opinion that it is uniform and certain in its results, and possesses many advantages peculiarly its own, not the least of which is the allowing of long exposure to bring out detail in the shadows, without fear that the more strongly-lighted parts will be overdone. It permits of the ready removal of stains during development, the film being so hard that a camel-hair brush may be used for that purpose.

On the other hand, the use of the second bath involves considerable additional trouble; the plates, unless carefully prepared, are liable to blistering of the film; and, after the final sensitizing, their keeping properties are limited. This latter inconvenience, however, may be remedied by washing in salt and water, then in plain water, and finally applying tannin and gallic acid to restore intensity. But all this tends further to complicate an already not over simple process.

Nevertheless, to those who do not object to the trouble of preparation, the committee have not the slightest hesitation in recommending the Taupenot process as safe, and, with proper manipulation unsurpassed in its results.

The Fothergill Process.

Of all the dry processes this, perhaps, is in more general use than any other. Its simplicity and certainty, particularly for small plates, especially recommends it to the amateur.

The following are individual opinions of some of the committee who have been in the habit of adopting this process:—

Mr. Borchert describes it as being "the best process, with *little* washing for highly sensitive plates, with *long* washing for keeping plates of average sensitiveness." Mr. Martin says, "my practice has been confined almost exclusively to Fothergill's original process, with which I have been very successful. I like it for its simplicity, and shall continue to practise it." In Mr. Clark's hands "the process has proved very successful, more so indeed than any other. The exposure is short compared with many other processes."

With some of the committee there appears, however, to be a difficulty in obtaining a surface of uniform sensitiveness and intensity, more particularly with large plates. Mr. Davis says, "The difficulty of obtaining an evenly sensitive film of albumenized nitrate of silver affords a decided impediment to the successful practice of the process." Mr. Hannaford, in order to overcome this difficulty, recommends the use of a second bath of nitrate of silver, of the strength of about five grains to the ounce. The plate when taken from the sensitizing bath is to be thoroughly washed, and then immersed in the weak bath, by which means a more uniform coating of free silver is got on the plate than by the ordinary method of washing with a limited quantity of water, or until greasiness disappears. He also calls attention to the modification of this process, which will be given presently.

Particulars of Manipulation.—Numberless modifications of the Fothergill process have from time to time been given; the Committee, however, prefer the following simple plan which is more generally used than any other, and which is thus described by their colleague, Mr. Clark:—

"The modification I have adopted is that of washing the plate freely after sensitizing, in any quantity of water, until the greasiness entirely disappears. I then pour on one corner of the plate sufficient albumen solution to flow freely over to the other end, this forces the water before it. I then place it on the levelling stand, and pour a second quantity of albumen on, and allow it so to stand while I coat another plate. It is then washed in a large quantity of water and stood to dry. My albumen solution consists of 1 of albumen to 3 of water, and ½ oz. of ammonia to the pint, it is beaten well up, allowed to settle, and decanted; I prefer this to filtration."

This method is similar to that lately described to you by Mr. Howard, in his eminently practical paper read at the February meeting of this Society.

The addition of a chloride, or a citrate, to the albumen is advantageous in certain circumstances, such as of over intensity he complained of, but the above simple plan will be found to give the most charming results.

The following modification of this process has been proposed by Mr. Hannaford.

Mr. Hannaford's Modification of the Fothergill Process.

Many complain that in preparing large plates by the Fothergill process they experience difficulty in obtaining a surface producing equal sensitiveness and intensity throughout. This difficulty I had to a considerable extent got rid of by thoroughly washing on removal from the sensitizing bath, and afterwards redipping in a second bath containing about 5 gr. of silver to the ounce. But this method, evidently involving a multiplicity of operations, and the true beauty of the Fothergill process being its simplicity, I have been induced to make some experiments having for their aim the reducing of the process to as simple a form as possible, so as at the same time to obtain the best results.

These experiments have not been carried to the extent I purpose, and I cannot therefore give the exact formula in the modification I am about to suggest; nevertheless, I trust my remarks will not be without some degree of interest to the society.

The first point to which I directed inquiry was this:—What action ensues on applying the albumen preservative to the partially-washed plate? It is very generally supposed that the free silver remaining on the film is thrown down as an albuminate; and, therefore, as the amount of washing the plate receives, regulates the quantity of this albuminite, thereby affecting the sensitiveness and intensity of the film, we have received various instructions respecting this part of the manipulation ranging from the "four drachm" to the "unlimited."

Now, it will be found that if we place, say, half an ounce of albumen mixture in a glass, and add a drop or two of our silver bath, the white precipitate at first found is almost immediately redissolved by the ammonia in the solution. The same action ensues on the albumen coming in contact with the free silver on the partially-washed plate. But it is evident that the ammonia becoming weakened by partial saturation, as it flows on over a large surface, its action is not equal at all parts.

Again, following the same line of reasoning, we may consider that as albuminate of silver remains on the plate when finished but while still wet. The film, I think, mechanically retains a part of the albumen, which in its turn mechanically holds a portion of the silver in combination with ammonia. It is possible, however, that the salt may be a double one of ammonia, nitrate of silver, and albuminate of silver. Whatever it is, we no doubt get a soluble, instead of an insoluble salt, and which on evaporation of the ammonia, combines again with the albumen to form albuminate of silver. Thus whilst wet we have the soluble salt, but when dry, so that the ammonia has evaporated, the albuminate of silver is formed in the pores of the film.

Reasoning in this manner, it at once struck me that to form this silver compound in the albumen mixture, would be much neater than obtaining the same thing at random on the film. This I did by adding nitrate of silver as long as the precipitate would dissolve.

In order that you may be enabled, should you desire so to do, to follow out my suggestions, I will give you the plan by which, so far, I have best succeeded:—

Particulars of Manipulation.—To the white of one egg add three ounces of water, and about twelve minims of ammonia. This, well beaten, is the ordinary albumen mixture for the Fothergill plates. Now add silver solution drop by drop, at first a white precipitate is formed, but quickly re-dissolved. Directly, however, this albuminate of silver is no longer so dissolved, cease. The mixture should present a slightly milky appearance, and in this state may be kept some time. Its keeping qualities will, however, be better with the addition of just ammonia enough to re-dissolve the milky precipitate, and in this state, I think, works cleaner than any "mealy" collodion giving good results in the wet state, and after sensitizing *thoroughly*, wash in an unlimited quantity of water. Now pour on the albumen mixture, and allow it to flow over the plate for about a minute. Then again thoroughly wash, and dry.

It is not needful that the albumen should be removed by washing. In this case, the mixture should be quite clear, ammonia being *slightly* in excess. This plan gives all the simplicity which is claimed for the tannin process with its disadvantage of the danger of losing the film. Development of these latter plates is tedious, but the former come out readily and intensify to any desired extent.

Petschler and Mann's Process.

In the hands of the Committee this process has not come up to what it at first appearance promised. It is less satisfactory in its results than the Taupenot process, liable in a greater degree to a blistering of the film, and not capable of being exposed to diffused light with impunity when in the "insensitive" state.

The Committee have to thank Mr. Mann for the courteous manner in which he has afforded them information during the course of their experiments.

(*To be continued.*)

Scientific Gossip.

The interest excited by the newly revived spectrum observations (we cannot call them discoveries, since so much has been done years ago in England), increases rather than abates, and the process seems to be destined to take its place permanently amongst the ordinary methods of chemical analysis. Another new element has been discovered by its means by Bunsen. It accompanies cæsium in the mineral water of some German spas, and like that metal is one of the same family as potassium, sodium, and lithium. The spectrum of the new metal consists of two splendid red lines situated beyond the red line Kα in the ultra red portion of the solar spectrum. Hence it has been proposed to call the new metal *Rubidium.*

Whilst we are anxious to do full credit to continental discoverers in this new branch of physical optics, we must not forget that much, very much of what is now put forward as new, has been already observed in England. A few weeks ago we drew attention to Professor Wheatstone's discoveries of the spectra of the magnetic spark from different metals. We propose now to draw attention to some notes of experiments which Mr. Fox Talbot has made on artificial spectra. In a paper which he published in 1834 he drew attention to the advantage of employing spectrum analysis for the purpose of distinguishing between strontium and lithium, each of which is remarkable for the fine red tint which it communicates to flame. It is difficult to distinguish between these bodies with the unassisted eye, but Mr. Talbot found that the prism displayed between them the most marked distinction that could be imagined. The strontia flame exhibits a great number of red rays well separated from each other by dark intervals, not to mention an orange, and a very definite bright blue ray. The lithia exhibits one single red ray. The author thereupon proceeds to say that he does not hesitate to say that optical analysis can distinguish the minutest portion of these two substances from each other with as much certainty as, if not more than, any other known method.

The same gentleman has also recorded some curious observations on the flame of cyanogen, which show that if this gas could be procured at a reasonable price, it would be perhaps the best substance known for the photographer to employ for the purpose of illuminating objects of which copies were required to be taken at night. When the magnificent violet flame of this gas is viewed with a prism in an appropriate apparatus, it presents a very distinct and peculiar character, separating the violet end of the spectrum into three portions, with broad dark intervals between. But the most remarkable fact is this, that the last of these portions is so widely separated from the others as to induce a suspicion that it may be more refracted than any rays in the solar spectrum. Mr. Talbot states that this separated portion has a pale undecided hue; he should hardly have called it violet, were it not situated at the violet end of the spectrum, but to his eye it had a somewhat whitish or greyish appearance.

A gentleman upon whose calculations reliance can be placed, recently stated that every cubic mile of the waters of the Atlantic contained upwards of fifty tons weight of silver, and consequently set experimentally inclined persons at work devising methods of rescuing some of this precious metal from the "vasty deep." Within the last week or two however, the attention of the would-be silver miners in England has been diverted to a new channel, and they are all, on the strength of two mysterious letters which appeared in the *Times*, searching after "oxide of silver," which it is supposed exists in enormous quantities in the refuse from various mining operations. Any fresh and abundant source of this important metal has especial attractions for the photographer, whilst we need not add that the commercial world in general take deep interest in an announcement which, if true, might seriously derange the currency. We have accordingly taken considerable pains to ascertain what foundation there might be for the statement that native oxide of silver had been found in abundance in the neighbourhood of the ordinary silver deposits, and we are sorry to say that there appears very little chance of this report being correct. The plain statement of what was enshrouded in very vague and mysterious language in the original announcement, appears to be this, that certain Cornish gozzans, which, when assayed by one chemist, were reported to contain from 5 to 13 ounces of silver to the ton, when tried by another assayer, were shown to be as rich as from 54 to 216 ounces per ton. This, we believe, embraces all that has been done, and upon this slender foundation the writers assume that the increased amount of silver arises from the silver being present in some mysterious combination with oxygen, forming an "oxide of silver," of, however, such different properties to the ordinary oxide of silver, which photographers are acquainted with, that the usual methods of assay are quite inadequate to detect its presence, and some round-about plan must be adopted to separate its metallic constituent from it. To a chemist such an idea as this is absurd on the face of it. We all know what oxide of silver is. Who that is in the habit of much experimentation with neutral baths, does not keep in some dark corner a little bottle containing a moist dark brown powder called oxide of silver? Now this oxide of silver is one of the most unstable things known, simple exposure to air, light, heat, or the action of rain would at once decompose it with separation of the metal, or cause it to pass into the state of carbonate or chloride, so we can leave it to our readers to judge for themselves how long it is likely that oxide of silver would remain, as such, in so complicated a mixture as "gozzan." The fact is, we believe, that the owner of the property upon which the ore has been discovered, has been agreeably surprised to find that it is richer than the first assays led him to believe; such occurrences as these are far from uncommon. The plentiful Cleveland iron ore was for a long time cast aside as valueless, until some clever metallurgist pointed out to the iron-master upon whose property it occurred, that it contained as good a percentage of iron as many ores which he was bringing to his furnaces from a considerable distance. Another more striking instance occurred in Australia, where immense quantities of the refuse from the quartz-crushing and amalgamating machines were rendered capable of being reworked at a handsome profit by the simple expedient of putting some wood ashes along with the quicksilver in the amalgamator. We are, therefore, quite prepared to admit that silver may be more widely diffused than has hitherto been suspected, and that it may occur in comparatively large quantities in some Cornish minerals, but further than this the evidence will not carry us. It would puzzle the first chemists of the day to settle definitely as to the existence of oxide of silver in a complicated earthy mixture, and we must certainly ask for some particulars of the experiments and train of reasoning, upon which the presence of oxide of silver in a natural state is assumed, before we can admit of its existence.

A patent, which has recently been taken out, will be found to present some points of interest to the photographer. It is by M. F. R. Grumel of Paris, and is for albums for holding collections of photographs; and which may also be used for preserving lithographs, engravings, and other drawings in. Each leaf of this album is formed of three parts or layers, the two outside ones and the middle one are to be of a thickness about equal to the card or cards to be enclosed; the two outside leaves have a portion of their central parts cut out in form a little less than the cards; the middle one having also a portion cut out in the centre but larger than the other two, and having in addition a portion cut away from the bottom. The three are now superimposed, so that the central spaces coincide, and the edges of the three layers are glued or cemented together all round, except where the portion of the middle layer at its bottom edge is cut away. The cards or pictures are now inserted through this bottom opening and pushed up to the central space, the two outside layers with the inner one forming slides and frames for retaining them in their places. Either one or two cards may be inserted. If two, they are placed back to back, so that there will be a face on each side of the leaf. A small piece of cotton or silk attached to one side forms a hinge or substance by which to bind the leaves so as to form a book. Each leaf may also be arranged so as to expose several openings, each holding cards. It will be seen from the above that this is merely the ordinary album, which is now so popular for holding the *carte de visite* photographs. The arrangement has always struck us as being very clumsy, and it certainly should not form the subject of a patent. The plan is so obvious, that we feel sure some hundreds of amateurs had it in general use long before this patent was applied for.

ON THE TESTING OF COLLODION AND PRINTING BATHS.

BY GEORGE DAWSON, M.A.*

In fulfilment of my promise to carry out an extended series of experiments—the results of some of which you already know—I have now the pleasure of laying before you a larger stock of facts, from which I think we shall be able to deduce a considerable amount of useful information.

Through the kindness of Mr. Hughes and of some other

* Read at a meeting of the North London Photographic Association, March 29, 1861.

friends I have been favoured with many specimens of old printing and collodion baths, all of which I have examined with great care on every point which I thought might be useful in the present inquiry. But, in truth, the question, from causes to which I need not particularly refer, has assumed a prominence and importance far beyond its merits.

Practically speaking, I can scarcely fancy a photographer of any standing sitting down quietly every morning to ascertain how much his baths may have lost in strength since yesterday. It cannot be to acquire useful information, but to gratify an idle curiosity; for he knows, or ought to know, the original strength of his solution—he knows that silver is abstracted each time he excites a plate or paper; and experience soon teaches him to estimate this amount pretty nearly. In short, it is the usual rule, I believe, not to cease using a bath so long as it continues to give good results. There are cases when testing may be of use, but they are exceptional, and not of frequent occurrence. Nevertheless, as the question has been raised—what is the best, quickest, and most easily applied method of testing a negative or positive solution, so as that we may be able to tell within a grain or so the strength of the bath with which we are about to operate?—I shall now contribute my mite towards its settlement.

Several plans have been proposed and instruments devised for this purpose, all possessing defects and advantages in a greater or less degree, which I shall examine separately.

1. Specific Gravity Test.—Against this test it has been urged, with great theoretical probability, that the accumulation of light matter in collodion baths and of heavy matter in printing baths renders its indications valueless. This objection is true to some extent, but not nearly so far as is generally supposed. In proof of this I am able to bring forward some potent facts:—Out of fifteen old printing baths sent to me from all parts of the country for analytical investigation, and varying in strength from 49 to 100 grs. nitrate per fluid oz., all—with one remarkable exception, to be referred to more particularly hereafter—showed by the sp. gr. bottle an amount of nitrate of silver exceeding what they really contained only by from 1 to 5 grains. The exact average of excess was 3·45 grains. The nitrate of soda and ammonia varied from ·75 to 6·25 grs., average being 4·85 grs. In some cases there was not sufficient nitrate of soda or ammonia present to account for the high sp. gr., but in all such instances the baths contained free acid, which seemed to have quite as much effect on the test as the presence of the nitrates. In no case did I detect nitrate of baryta.

I cannot vouch for the accuracy of the strength of any solution of pure nitrate of silver, as indicated by its sp. gr. To my knowledge no reliable tables have yet been constructed. My estimate is based on the following rule, which I have made out by experiment. It will be found, I think, correct to within about a grain.

When sp. gr. is 1·052, or under, reject the integer, take the first two places of the decimal as integers, and the third as a decimal, then multiply by 5·75.

Sp. gr. 1·053 to 1·090 multiply by 5·5.
,, 1·090 to 1·160 ,, 5·25.
,, 1·160 to 1·190 ,, 5·2.

For instance, suppose the sp. gr. of the solution to be 1·146, reject the integer 1: taking the first two decimal places 1 and 4 as integers, and the third, viz., 6, as a decimal, we have 14·6; and as by the table 1·146 lies between 1·090 and 1·160, we have to multiply by 5·25—thus $14·6 \times 5·25 = 76·65$ grs. Now, observe, I do not by any means give out this rule as accurate: by a little *easing of the angle* the indications will be sufficiently near for practical purposes. Hereafter, should the subject be considered of sufficient importance, I may, with more time at my disposal, be able to furnish photographers with a more exact and reliable table. Should any one feel disposed to test the present one, he must not suppose that a newly made solution, say of 90 grs. pure nitrate of silver, dissolved in three ozs. of water, will show 30 grs. to the oz.; for the water, by the addition of the nitrate, has expanded to more than 3 fluid ozs., and ought to indicate somewhat less than 29 grs. Nor is this expansion equal by equal increments of nitrate: it increases upwards; and this is the great difficulty which besets us in the construction of these tables. A progressive law of expansion evidently exists, and probably may be ascertained by a few accurate and well-directed experiments. If so, a series of calculations will be all that is necessary for any strength of solution. After all, however correct we may make our tables for pure silver solutions, their accuracy will be sadly disturbed when testing impure materials. Of the fifteen old printing baths submitted to my examination, the fourteen whose averages I have already given seemed to contain extremely little impurity derived from the original nitrate. Probably the free acid they all contained in a greater or less degree may be attributed to that source. But this seems not to have been the case in the exceptional bath. Its sp. gr. $= 1·193 =$ about 100 grs. nitrate of silver to fluid oz.; whereas a correct analysis gave barely 90 grs. silver and 21·5 grs. of other nitrates and organic matter. A large proportion of these 21·5 grs. was nitrate of potash. How this salt could have got into an old printing bath I am at a loss to comprehend, unless introduced originally along with the nitrate of silver.* For such solutions as this, I admit, the sp. gr. test is utterly valueless.

To those, therefore, who may select this method of testing their old baths, I would recommend the use of at least tolerably pure nitrate of silver; the avoidance of chloride of barium, whose atomic weight is very high, as a salt for their paper; and the abstaining from the addition of any extraneous soluble matter: all of which would materially affect the sp. gr., and render any rule of calculation impossible. The temperature should also be taken into account—60° Fahr. being the standard. For every 10° below this, deduct 1 gr., and for every 10° above, add 1 gr. It may also be of importance to know that the blackening of a printing bath from use does not sensibly affect the sp. gr. One, indeed, I had as black as ink, which, after clarification by kaolin, was affected slightly, but not sufficient to alter the sp. gr. to the extent of $\frac{1}{1000}$. The discoloration I attribute entirely to the suspension of very fine undissolved particles of organic matter in the liquid. With these few precautions attended to, and after deducting from 1 to 5 grs. according to the more or less extensive use of the bath, the sp. gr. indication will tell us to within about 1 gr. the actual amount of silver present—sufficiently near, I should think, for all practical purposes.

As respects old collodion baths, this mode of testing is scarcely so reliable. In six specimens subjected to analysis, the error ranged from 2 to 7 grs. all in one direction, viz., *below* the real quantity of nitrate present. I do not think we can fix this error so definitely as in old printing solutions; for, if a collodion bath when not in use be well stoppered or closed up, the error will be greater than if (other conditions being equal) it were left in a warm place, and exposed to the atmosphere. It has been strongly urged that the error may sometimes lie on the other side, and an instance has been produced in proof. I am not by any means sure, but I believe, that one of my seven analysed specimens, was the identical instance adduced. It was contained in a bottle labelled "old collodion bath," had rather a large sediment of flocculent organic matter, and smelt very strongly of stale pickles, masking completely the smell of ether and alcohol, if it contained any. The sp. gr. was 1·065, showing about 36 grs. to the oz.; whereas, by careful analysis, it contained only 26·95 grs. nitrate, and 6·75 grs. foreign matter—a large proportion of the latter being organic. One fluid ounce freed from silver by chloride of sodium required 19 grs. dried carbonate of soda to produce neutrality. The acetic flavour being thus destroyed, the alcohol and ether should now have made themselves perceptible; but they did not, and I doubt whether a trace of either was there. I have therefore no hesitation in saying that this so-called collodion bath was never used for that purpose at all;† or if so, the ether and alcohol it contained, from exposure to the air, or from some other predisposing cause, were converted into acetic acid, which affected the sp. gr. to such a degree.

2. Hydrometer Tester.—To the form of this instrument as sold in the shops some strong objections may be urged. In the first place it is graduated arbitrarily, that is, it does not show the sp. gr., which in some measure would be a check on its correctness. Secondly, the stem is too short, and, in consequence, the scale is crowded into too small compass to enable us to read accurately its indications. In principle it is of course the same as the former method; and when we obtain good sp. gr. tables of pure nitrate of silver solutions, and a better mode of manufacturing the instrument, that it may show clearly on one side of the scale the sp. gr., and on the other the corresponding grains of nitrate, we may hope to see it exten-

* This printing bath, we are informed by Mr. Dawson, was, as he has since ascertained, that of Mr. Macfarlane, of Glasgow.

† This bath was Mr. Bowman's, of Glasgow.

sively used, both on accouut of its approximate truth, and its exceedingly simple mode of application.*

3. Another class of instruments has been devised, depending on a different principle, viz., that 58·5 grs. of chloride of sodium will exactly precipitate 170 grs. nitrate of silver. Theoretically this should give perfectly correct results; and, even practically, with extraordinary precautions and extremely delicate instruments, we may depend on it to within $\frac{1}{300}$ of a grain. But what do we find with theso instrumeuts? We find them in the hands of different individuals, and even of tho same individual, giving very contradictory conclusions—sometimes four or five and even more grains over the mark, and sometimes, but seldomer, as many below. Indeed this is not to bo wondered at when wo consider tho many sources of error common to them all. It is difficult to obtain pure chloride of sodium and to dry it perfectly; for the water is not altogether expelled till it has ceased to crepitato under a strong heat. Our glass measures as usually sold are never accurate; and even were they so their shape aud large surface precludes tho possibility of their being accurately used. Moreover, as respects the instruments themselves, on account of their arbitrary graduation, wo have no very obvious and ready means of ascertaining whether tho error which is sure to exist ought to be laid at their door, or that of tho solution, or both combined. In truth, the error is not constant nor always in the same direction, and cannot, therefore, be allowed for. Nono that I havo seen have any arrangement for the violent agitation necessary for tho complete clarification of tho liquor without waste. Finally, when wo recollect that a possible or rather probable large error in one drachm of nitrate solution has to be multiplied by eight, it is only a matter of wonder that their inaccuracy is not greater. A uico balance of errors may occasionally bring about a happy compromise pretty near the truth, but this must be of very rare occurrence. I havo no hesitation, therefore, in condemning these instruments to tho class of philosophical toys, fit only to amuso a photographic amateur and to waste his solutions on a rainy day.

A fourth method, founded on tho same principle, has been proposed, possessing, however, all the defects of the previous plan, attributable to impure materials and imperfect measures, but avoiding others incident to the instruments themselves. It consists in dissolving in a certain quantity of distilled water puro dried chloride of sodium, sufficient to precipitate one gr. nitrate of silver by one fluid drachm of the solution. Tho relative proportious of water and chloride of sodium may be readily ascertained from the atomic weights of the two salts to be acted on. Since tho combiuing number of chloride of sodium=58·5, and that of nitrato of silver=170, it follows by an easy calculation that 66 grs. chloride to 24 oz. water is about tho right proportion. The mode of applying, and the probable results, of this test will be seen from the following experiments:—

I obtained from threo manufacturing chemists of considerablo repute as many specimons of so-called "pure chloride of sodium," which for convenience we shall call 1, 2, and 3. With each I operated separately on a new solution of nitrate of silver, containing rather over 80 grs. to the ounce. *I used three different sets of measures throughout in all the subsequent operations.* After drying for two hours a portion of No. 1 ou a sand-bath, at a temperature of about 400°, I weighed out 33 grs. and dissolved in 12 oz. distilled water. I mado similar solutions of Nos. 2 and 3. Two fluid drachms of the nitrate, along with the washings of the measure and a little nitric acid, wero now poured iuto an 8-oz. stoppered bottle, and solution No. 1 added to the point of no moro precipitation. I repeated the experiment with 2 or 3, using, as I have said before, different sets of measures. There was a very considerable discrepancy in the results—a solution containing exactly 80·25 grs. being represented by the numbers 78·5, 84, and 86·5 grs. respectively. To what causos are we to attribute so much uncertainty and error? Chiefly to tho utter uufitness of our glass measures for such delicate experiments. For instance, besides their ordinary defects, which must be patent to us all, there is another and very curious source of error not generally known, attributable to the fact that, although our quarts, pints, and ounces are constructed as they ought to be, from the standard of the avoirdupois, our drachms, graduated iuto minims, are made from apothecaries' weight, containing 480 grs. to the ounce. They are, therefore, calculated to contain 60 instead of 54·7 grs. distilled water at the temperature of 60°.

Another modo of testing, which can scarcely be called of practical value to the photographer, but capable, in the hands of one accustomed to chemical manipulation, of great exactitude, is useful when we want to estimate how much foreign matter is present in our old baths, beside nitrate of silver. Its principle is different from tho former, and consists in precipitating the nitrate by puro hydrochloric acid; filtering, washing, and drying the precipitato along with its previously weighed filter, till they cease to lose weight, and then calculating the nitrate from the weight of chloride. The filtrate, with all tho chloride washings, when evaporated to dryness, will show by tho weight of residue, the other uitrates and organic matter which may have been present. A slight error in estimating the silver may occur when operating on a very dark coloured old bath—a small quantity of organic matter (never according to my observation reaching $\frac{1}{4}$ gr.) suspended in the solution being precipitated along with the chlorido detained by the filter, and not got rid of by any amount of washing. But, if we first clarify with dried kaolin, *no* organic matter is thus thrown down.

Having now expressed my opinions and the reasons for the same pretty freely, but necessarily very briefly, on the advantages and disadvantages of tho several testing systems which have come under my notice, I may expect furious attacks from certain interested or over-sensitive parties, who may feel themselves aggrieved by my unbiassed and disinterested expression of opiniou. To such individuals I may beforehand reply—and this is the only reply they may have—that unless they can show error in, and unwarranted deductions from, the facts I have adduced, no notice whatever will be taken of their communicatious. If they show either of these I shall bo glad to retract my opinion for the higher pleasure of gaining a new truth. I have no hesitation then in pronouncing the hydrometer, when properly constructed, and when used with the proper precautions, superior to all the ordinary modes, and perfectly sufficient for the purposes of tho practical photographer.

Should greater nicety be required, I am prepared with a method, or rather a modification of a method—and, indeed, had it incorporated with this paper—by which, without any great trouble or extraordinary manipulations, we can tell within $\frac{1}{60}$ of a grain the amount of silver in any solution. It is the plan I have adopted throughout tho course of my experiments for checking tho analysis by hydrochloric acid, which I was compelled to have recourso to in order to estimate the other nitrates and organic matter. The instruments I used were made by myself; and, in getting moro artistic-looking duplicates mado by Mr. Zambra to show you, an accident occurred which compels mo reluctantly to defer this part of my paper to next meeting, or to consign it to a quiet corner of our Journal.

* Mr. Dawson informs us that he has just completed a very carefully calculated specific gravity table for pure nitrate of silver, ranging from 10 to 140 grains, which will shew that the estimates, by specific gravity hitherto have been rather too high. We hope to publish it shortly.

ON THE FADING OF PHOTOGRAPHIC PRINTS.

BY H. H. SNELLING.*

In my printing operations I have, as I said before, confined myself to no oue formula. I have toned and fixed separately, and have used the toning and fixing solutions together, and I cannot give preforenco to either method so far as permanency is concerned; but as regards clearness, solidity, and delicacy of detail, I consider the mixed bath has decidedly the advantage. In confirmation of this opinion I will present a few illustratious, with the formulas by which some of them were made, going back to the introduction of photographic printing.

I here present to the society one [marked No. 6], of thirty-two prints I received from Mr. Blanquart Evrard, in 1850; made before tho introduction of tho gold-toning process. These prints wero made from paper negatives; glass at that time being very little, if at all, used in France. Eight of the thirty-two proofs I had framed (the rest I gave away), and of these eight not one has exhibited the slightest disposition to fade. For permanency I consider nothing cau be more perfect, and in other respects they are not inferior to photographs of the present day. These pictures have hung for ten years or more on my parlour wall and have been subjected to tho severest tests. The method given for toning and fixing these pictures

* Continued from p. 176.

—in a printod treatise which accompanied the proofs—was as follows:—

Hyposulphito of soda	1 part.
Water	5 or 6 parts.
Nitrate of silver, a fow grains; quantity immaterial.	
Acetic acid, sufficient to give tho desired colour.	

Mr. Evrard also gives instructions for obtaining proofs of any desired tint, from the finest black to the most delicate sepia. A perusal of his work will show that many of tho so-called modern improvements in paper photography were pretty well investigated by this early writer.

No. 7 is a proof made by M. Renard, of Franco, moro than a year later than No. 6, and sent to me as a specimen of tho then new method of toning with chlorido of gold. It will be seen that this picture is fading. Decomposition set in it about two years after it was hung up.

That gold is not essential to the fineness of the print or permanency, is fully proved by these prints. I would also state in confirmation of this fact, that Mr. Turnor recently showed me some prints made some years ago (hyposulphito of soda and chloride of silver being the toning and fixing solution) that are as fresh and perfect as on tho day they wero made.

I will now proceed to somo of tho photographs which have from time to time illustrated my journal. I regret that the formulas for toning and fixing were not always given, but from their having been dono by the various methods spoken of, I am convinced that, with ono or two exceptions, all could have produced permanent photographs, if sufficient caro had been taken in the manipulation.

No. 8, was made by Mr. Whipple, of Boston. Ono thousand impressions of this print wero taken in November 1853, and of those that have come under my observation, not one has faded. In some tho colour has changed in spots from handling with dirty fingers.

No. 9, also by Mr. Whipple. Nearly all of these faded, evidently in consequence of being varnished with gum-arabic and sugar.

No. 10, also by Mr. Whipple. These were varnished, and many of them faded; also No. 13. The majority, however, remain perfect to this day.

No. 11, by Mr. Whipple, although not varnished, have faded more or less, ovidently from having been mounted with sour paste.

No. 12, by Messrs. M'Clees and Germon, of Philadelphia, exhibit, thus far, no ovidences of fading.

No. 14, by Messrs. Masury and Silsbee, of Boston. These were undoubtedly toned in a lead bath, and are varnished, yet I have seen none that have faded.

No. 15, by Messrs. Richards and Betts, of Philadelphia; all these, so far as I have seen, have remained as they were delivered to this day.

No. 16, by Mr. Whipple, and varnished, all faded.

No. 17, by Messrs. Richards and Betts, havo all faded, as seen in the samples, undoubtedly from improper toning.

Nos. 18 and 19 are the pictures mentioned by Mr. Seely at one of our meetings last year, as having been printed by himself, and in illustration of tho permanency of tho method he advocates. Many having faded, as shown by one of the prints hero given, the validity of my objection to his theory is mado manifest. This will be further proved.

In the specimens which follow, the formulas for taking which will be given, I can refer the fading in every instance, except one (No. 29) to unskilful manipulation, rather than to the nature of the bath. In nearly all, some prints havo remained perfect under all circumstances, showing that when the *work* was proporly done, tho process was not at fault.

No. 20. A view of the *Palace of Industry* was toned in a bath composed of hypo, salt of gold, chloride of silver, and a few drops of ammonia; and afterwards submitted to a bath of hypo, 1 lb. to the gallon of water. All these pictures faded where the colour was pushed to the black.

No. 21. *A Group*, by Mr. Hayward, of Boston. In salting the paper for this picture, one grain of gelatine to the ounce was mixed with the solution; it was sensitized with a thirty-grain solution, and toned and fixed in a bath made of—

Hypo soda	1 lb.
Chloride of gold	180 grs.
Chlorido of silver	2 oz.
Chloride of lead	2 oz.
Water	1 gal.

Not one of theso pictures have faded.

No. 22. *Columbia College*. These pictures were first fixed in a bath consisting of water 2 gals., hypo 2 lbs., aqua ammonia 40 drops; and then tonod in, water 2 gals., hypo 2 lbs., acetate of lead 1000 grs., salt 1000 grs., chlorido of gold 90 grs., chloride of silver 2 oz. Very fow changed evidently from over-toning.

Nos. 23, 24, 25 and 26, were toned in the same way as No. 22. A great many have fadod.

No. 27, was tonod and fixed (without previous washing) in hypo 2 lbs., Burgess gold 12 bottlos, acetate of lea to satura tion. Some of these faded, but tho majority remain perfectly good.

To show the effects of slight modifications in tho toning bath I givo two prints of *Mrs. Mozart*, Nos. 28 and 29. Both wero printed on American gelatinized paper, sensitizod in the usual way; No. 28 fixed in a bath composed as for No. 21.—No. 29 with lemon juice added. Every print toned without the lemon juice remain perfectly good, whilo those toned with it have all faded.

No. 30, Portrait of Mr. Piard, was toned and fixed in the same bath as No. 22, without provious washing; nono have faded.

I would again call attention to the threo prints I presented on a former occasion, Nos. 31, 32, and 33; No. 31 was toned in a bath of hypo and gold. No. 32 in tho same bath, with five drops of a saturated solution of citrate of iron to the pint added. No. 33 in a solution of aqua ammonia, ten drops to the print, only. It will bo perceived that there has been no change in these prints since they wero first exhibited, and I am convinced that a careful series of experiments will determine that we can do without hyposulphite of soda by substituting aqua ammonia and thus render the permanency of the photographic print a certainty.

I have used every modification of the toning bath, and have found that, for permanency, tho less complicated it is the better; that in making it, it is necessary to avoid an excess of any activo ingredient, and when any are in excess to watch the prints closely to avoid undue action.

I have found that proofs printed by diffused light tone better, keep better, and are in every respect finer than those printed in direct sunlight. The longer they aro printing without turning yellow, the more solid and brilliant they will be. Sunlight pictures are the first to fade.

The longer they are arriving at the proper degree of strength under the influence of light, the more toning they will bear without losing the delicate middle tints, the more transparent will be the shadows, and the stronger will be the black without sulphurization.

That it is best never to suffer tho print to pass the purple tint in toning.

That it is impossible to ensuro permanency if more prints are put into the bath than it will float without their touching each other; or if they are suffered to lie still; thoy should be kept constantly in motion. Nor is it possible when spongy paper is used.

Finally, every possible caro should be taken in every part of the process, from tho first handling of the paper to the mounting of the print. Filter all the water beforo and after making your solutions, and your toning bath every day, if a large number of proofs are daily made, and at least every third day if the number is limited. This will enablo you to use up every particle of the toning bath without fear of spoiling any of your prints. Keep everything clean, and keep all vicious chemicals out of the toning room.

They say that "*care will kill a cat*," but rest assurod it can never kill photography, and that the want of it is the main cause of so many photographic failures.

Dictionary of Photography.*

Printing by Development.—The process of printing by development is one of the oldest of the paper processes, being necessarily involved in the principle of the calotype process. From whatever cause, it has never been largely practised, or come into popular use. This is somewhat singular, when it is remembered that during many months of every year, sun-printing is in this climate an impossibility; whilst printing by development may be effected under

* Continued from p 407, vol. iv.

almost any conditions of light. It is cheaper than sun-printing, no gold toning being required, and the exciting solutions used generally contain less silver. It is more permanent, most of the earliest calotype negatives and developed prints being perfectly good at this day. The probable cause why printing by development has not become popular, lies in the quality of prints that have too often been produced by that method, mealy prints, wanting alike in vigour and detail, being unfortunately amongst the common results.

That these are not the legitimate or necessary results of development printing is to us quite manifest from the fact that some of the finest photographs we have seen are developed prints, some by Blanquart Evrard, and others by Mr. Sutton, which have all the qualities of fine engravings. And we think it by no means improbable, that if anything like the same extended and varied attention had been given to the practice of this process which has been given to sun-printing, a much more favourable opinion of its capabilities would have prevailed.

We shall here first give the details as recommended by Mr. Sutton, because we believe no one has experimented so extensively or successfully in this direction, and because we are familiar, from personal observation, with his manipulation.

Amongst English papers the thin Hollingsworth paper is most suitable, and gives black tones and vigorous prints. Of French papers, Canson's thick positive is most suitable, and has a better surface than the English paper. There are two methods of preparing the paper previous to exciting with silver; one by means of iodides, or iodides and bromides, and the other by means of chlorides. The latter method is recommended for general use, because, whilst papers prepared with iodide of silver are more sensitive, that very sensitiveness increases the difficulties, especially to the beginner. An exposure quite insufficient to produce the faintest visible image is sufficient to produce a vigorous picture, where iodide is used, whilst the chlorided paper permits exposure sufficient for the eye to perceive satisfactorily a definite amount of darkening, in order to produce, on development, the desired results.

To salt the paper, which must, as in all printing processes, be first marked on the smooth side, take—

Chloride of sodium	8 grs.
Distilled water	1 oz.

Immerse the sheets for a few minutes and then dry. If the Canson paper be used, Mr. Sutton recommends the addition of a minim of hydrochloric acid to every two ounces of solution, and allowing the sheets to remain a longer time, so as to neutralize the alkalinity which characterizes that paper.

The silver bath is made as follows:—For Hollingsworth's paper—

Nitrate of silver	30 grs.
Lemon juice	4 minims
Distilled water	1 oz.
For Canson's paper,—	
Nitrate of silver	60 grs.
Lemon juice	8 minims
Distilled water	1 oz.

The chief reason for the disproportion between the strength of the silver baths for the two papers appears to arise from the fact that Hollingsworth's paper is soft and absorbent, and thus becomes sufficiently charged with silver in a weak bath. Great stress is laid on the use of lemon juice and its value in giving vigour to the print. Citric acid, Mr. Sutton states, will not do at all; the natural mucilage of the lemon being required, as well as its acid. The paper is excited by floating, smooth side down, for three or four minutes. It must be hung up to dry in a perfec ly dark room, as the faintest ray of light falling on it now will, on development, produce darkening and injury to the print. It will readily be seen that the latitude as regards the light to which the prepared paper can be exposed, which is often practised in sun-printing, cannot be allowed here.

The time of exposure will of course be regulated by the light, and must be continued until a faint image is perceptible. As the picture cannot be examined by the feeblest white light without injury, it is the best plan to leave sufficient margin exposed to serve for a guide as to the progress of darkening. In bright sunlight two or three minutes, or less, will be sufficient. With a clean good negative, the margins showing a faint tinge of lavender will indicate sufficient depth of printing.

To develope, turn up the edges of the paper all round, pinching them at the corners so as to make the print form a dish, and place it on a plate of clean glass. Now pour in sufficient of a saturated solution of gallic acid to cover the print. Use a glass rod bent into the form of a triangle for the purpose of rapidly spreading it all over the surface, and keeping the solution in motion. In a minute or two the development will commence, and will gradually progress, until, if the exposure has been sufficient, a rich deep black is obtained. The time required for development may be from five minutes to a quarter of an hour, or longer. The colour will pass through various stages of purple and brown, and may be stopped at any point if the print have acquired sufficient vigour. To secure the best effect the development should be carried a little further than appears necessary, as the print will lose a little in fixing.

To fix the print, place it in a bath of hyposulphite of soda, having previously rinsed it from the developing solution. The fixing bath is composed of one ounce of hypo to twenty ounces of water. It should be used fresh; about twenty minutes being sufficient to fix the print. We think that probably a little stronger bath, and shorter immersion might be better. The print will require washing to free it from hypo, as usual.

The tones when the picture is dry are of various gradations, of warm brown and black, and when the operations have been properly performed, have a peculiarly rich and velvet-like effect in the deep shadows.

A soft negative, full of detail, is best for the purpose, as this process has a tendency to give great vigour and contrast to the prints, which degenerate into hardness if very intense negatives are used.

A grain or two of iodide of potassium to each ounce of salting solution gives greater sensitiveness, as we have said, and a variety of purple tones, unalterable with salt alone, are produced in the picture.

Perhaps for use with the solar camera, or in any case where extreme sensitiveness is an object of importance, the use of iodides and bromides either in connection with a chloride, or for the purpose of entirely superseding it, may be desirable, and they are, we believe, generally preferred. Various proportions of iodide and bromide are used by different operators with the solar camera, with more or less of success. The proportion of iodide is generally about eight or nine to one ounce of water, and the proportion of bromide in conjunction with this quantity of iodide varies in different hands from six to sixteen grains. Probably the proportion used by Mr. Glaisher at Greenwich, in photographing the meteorological and magnetic records, might be found valuable here; they are eight of iodide to twelve of bromide, this proportion being found most sensitive to artificial light, and would probably be found the same for sunlight. The salts of potassium are generally used.

Development printing is best suited to plain paper, but may if desired be used with albumenized paper. The following details given by "Theta" in a former volume, it may be interesting to reproduce here:—

"Take any quantity of the whites of fresh eggs, and to each ounce of this add—

Chloride of ammonium	4 grains.
Citrate of soda	4 „

and water sufficient to dissolve these salts; beat up well, as in other processes, and float the paper upon it for three minutes, hang up to dry; this will keep a long time.

"The citrate of soda is made by neutralising 112 grains of pure citric acid with 133 grains of dry bicarbonate of soda. But in many places it may be procured at the druggist's.

"To excite this paper use 30 grains nitrate of silver, 30 minims pure acetic acid, 1 ounce distilled water; float the paper four minutes at least upon this, and dry in a perfectly dark place. Of course the operator must be particularly careful not to allow the faintest light to fall upon it when it is, or has been, upon the silver bath.

"The exposure is from one minute to ten, the best guide being the appearance of the print. If all, excepting the very lightest parts, is visible, the exposure has been long enough.

"The next stage is the development. The greatest plague in this process lies here. Often have I washed my dishes with *strong* solution of cyanide of potassium, and yet the print has become marbled; whilst, when I have turned up the edges of the print, making it into its own dish, I never had a single stain: the print should not be over developed, as it loses nothing in fixing or toning. A saturated solution of gallic acid is used for this, and as the print is never washed before development it needs the addition of no silver whatever. If the room, however, is *warm* in which the print is developed, a mixture of equal parts saturated solution of gallic acid and water is strong enough.

"To fix, use one part hyposulphite of soda in six parts of water, and allow it to remain in this solution 15 or 20 minutes.

"The prints may be toned with gold before fixing, as in other processes; but, if possible, until they are placed in the hyposulphite, they should not be brought into the light; as, even after well washing when developed, they are very liable to be rendered dirty-looking by the light.

(*To be continued.*)

Photographic Tourist.

PHOTOGRAPHIC RAMBLES IN WALES.—No. 2.*

BY J. H. JONES.

In my photographic rambles, I much prefer—when time will allow—to walk, for the pedestrian has a better chance of meeting with those wayside gems, which, when faithfully transcribed by means of our truthful and beautiful art, go so far to render our portfolios attractive. But I may state for the benefit of those who have not the time or inclination to walk, that there are several modes of conveyance to the head of the valley.

The first object of interest to the tourist in ascending the Vale of the Tawe, is the Copper Works, and should the day prove clear, with a south-westerly wind, some excellent pictures may be obtained of them from the turnpike road, the canal side, or the slag banks; the appearance of copper as well as iron works is of course the most impressive at night; and the Swansea Valley at this point forms no bad representation of the infernal regions, for the smell aids the eye; large groups of odd-looking chimneys and ricketty flues emit sulphurous arsenical smoke, or pure flame, a dense canopy overhangs the scene for several miles, rendered more horrible by a peculiar glare. This valley, from Swansea to Morristown, presented, as I wended my way upwards, a scene of busy industry, for here are congregated, within the space of four miles, no less than fifteen works for the manufacture of silver, copper, iron, tin, spelter and chemicals, besides the numerous collieries; the quantity of coal required for these works alone is enormous; and when it is borne in mind that the back freights of the vast fleets that arrive at the port is coal, some idea of the extent of the trade may be entertained.

Stopping occasionally to obtain a view of the largest of the works, here and there, and turning aside to the banks of the river to obtain others, the most prominent of which is the Landore viaduct, after a few hours I found myself at Morristown; there is nothing of interest here, except the Libanus Chapel, but it is so placed that I could not get a picture of it. Thus far the beautiful features of nature are completely defaced by the smoke of the works, and the ranges of unsightly buildings in every direction.

The vale, in its course upwards from Morristown to Hennenadd in Brecknockshire, is continually losing something of its useful, but artificial deformity. Every step I gave from here presented some fresh subject of admiration to my eye; in fact, I may say, that it would be an endless matter for me to describe everything which presented itself. I shall, therefore, only speak of those views, which deserve especial notice, but to those who may follow in my footsteps I can promise a rich fund of the best materials for forming a perfect landscape, on condition that they will turn aside occasionally from the turnpike-road to the canal (which run in many places side by side), which will afford a most agreeable deviation, barring the mud and dirt, of which there is plenty. Indeed, if we would but accustom ourselves to a tenth part of these inconveniences, which we are eager to encounter, swelling, as they do into real difficulties, on a foreign tour, we should entertain higher and more just notions of that variety, grandeur, and richness, displayed by our home scenery; to those who compare it candidly, either with their own observations, or the best accounts of continental landscape.

It was remarked by Wilson—whose authority is not to be disregarded on his own subject—"that a young artist might find, in some part or other of this Island, everything he could attain by going abroad, or, indeed, that he could possibly want to complete his studies, and form his style, excepting what is distinctively characterized as an Italian sky; and it may be much doubted whether English painters are not sometimes induced to show that they have travelled at the expense of propriety." We not unfrequently meet with men of respectable talents and sound judgment in the main, who talk about uniting the brilliancy of Claude with the grandeur and sublimity of Poussin. But surely such a combination of properties is unattainable in practice, and were it not so, it would confound all character, and consequently ought rather to be avoided.

We never see such heterogeneous mixtures in nature, which brings together such things as may harmonise and cooperate with each other; not such as must be eternally at variance. Nor can it be said with truth that there is less beauty in an English than an Italian sky, since each will be found to suit best with the general complexion of its respective scenery. When, therefore, it is considered, that an English student generally intends to exercise his talents on his own country, and for his own countrymen, a foreign education seems not so desirable as it was before we had respectable schools of native growth.

A habit of constantly observing the works of creation as they really exist, rather than as they are set down in treatises or practical specimens of masters, will teach him to vary his style, when he takes his subject from a different climate; but there is no real excellence in sketching a sky, under which vegetation must languish and be dried up; over a landscape whose verdure could only have been preserved in its luxuriance by the frequent distillations of a surcharged atmosphere.

But perhaps some of my readers will say, What has all this to do with photography? and to them I would say that it has much to do with it, and if not with photography it has much to do with photographers; for how many of my photographic readers are there, who would not prefer a tour through France or Italy, or elsewhere, in preference to a tour through the land of their birth? If the public require foreign views, there are surely enough of foreign artists to supply them, therefore, let every photographer look around

* Continued from p. 175.

him, and he will find sufficient work for his camera at less expense than he would at any other place away from his English home; as a proof of this, look at the photographs of English scenery by Fenton, Lake Price, Sedgfield, Bedford, and many others of our justly celebrated photographers; where will you find views to equal or surpass them in point of artistic beauty, or solemn grandeur? There are places, I will not deny, which are more attractive in point of interest connected with historical fact, but *will* these repay the labour and expense of getting them.

I will not digress any further at present, for fear of being tedious, and thereby damp the ardour of my kind readers. So next week I will once more return to the subject in hand.

(*To be continued.*)

Proceedings of Societies.

Manchester Photographic Society.

The monthly meeting was held on Wednesday, the 3rd instant, —Mr. Parry presiding.

Mr. Sidebotham, whose paper was to be discussed, was unavoidably absent.

Mr. Brothers had held at the last meeting that portraits taken with a good lens, with the circular stop, would not show distortion of the character spoken of by Mr. Sidebotham; and he produced four photographs in support of that opinion. The subject was a bust, in which a flowing beard stood out from the pedestal, and would at once show whether the ordinary lens gave rise to a stereoscopic effect not produced by the horizontal stop. The photographs were about one-third the size of the original—the first being taken with the stop with which he usually worked; the second with the full aperture of the lens; the third with Mr. Sidebotham's stop; and the fourth with a similar slit placed vertically. He invited the members to examine these carefully, and he believed they would say with him that no difference could be detected as regards the stereoscopic effect. The beard he had alluded to would prove this; for it would be found to extend to exactly the same point on the pedestal in all the copies. It was possible there might be some minute difference, but the eye could not detect it; and he could not therefore conceive it to be a matter of any practical importance. But he found that, on using Mr. Sidebotham's stop, the time of exposure necessary was three times that which he required when using the ordinary arrangement; and it consequently appeared to him that he should, without gaining anything of importance, lose considerably. Another defect, however, would be observed, and it was in order to show this that the fourth negative was taken with a vertical slit. On examining the pictures it would be observed that in both cases where the elongated stop was employed there was a drawing of the lines in the direction of that elongation, they being blurred horizontally when Mr. Sidebotham's stop was used, and vertically with the vertical stop.

A general opinion prevailed that no perceptible difference, except that pointed out by Mr. Brothers, existed in the pictures produced.

A conversation on the subject followed, in which it was stated that further tests ought to be applied, and several members resolved to experiment before the next meeting, when it was hoped Mr. Sidebotham would be present and the subject be resumed.

Mr. Noton then read some notes on the use of rectangular stops, detailing an experiment he had tried. Taking a stereoscopic camera, he placed a vertical slit-like aperture in front of the right-hand lens, and a horizontal one in front of the left-hand lens. The light was bad, and the circumstances unfavourable for getting a good picture. The subject was a tall chimney with trees, &c., in front. The result was that, with the vertical aperture, the outlines generally were good; with the horizontal aperture, the chimney was deficient in outline and looked slenderer, whilst the trees were remarkably crisp, sharp, and round.

Mr. Brothers said, that precisely the effect he had pointed out, of a drawing of the lines in the direction of the slit, would be perceived—the blurring up the chimney with the vertical stop and across it with the horizontal stop being most marked.

After some further conversation the proceedings terminated.

Photographic Notes and Queries.

The Best Dry Process.

Sir,—Among the multitude of dry processes I am in rather a fix as to which one I should employ. We have Fothergill's, Hill Norris's, Petschler and Mann's, and a thousand others to be found in your four volumes, and to the best of my belief no single hint from reliable authority as to which is really the best for beginners and amateurs who have but little time for experiments. If you would kindly inform me you would, I am sure, confer a great favour on many of your readers I shall certainly be grateful to you.

I have a large gutta-percha bath, and found great inconvenience from the plates catching in the sides while going down. I have put a strip of glass on each side and find that it completely obviates all difficulty; perhaps the hint may be useful to some of your readers who find the gutta-percha bath more convenient in their travels. I may state that for the last two years I have never had my solution out of my bath (which is, as I have said, a gutta-percha unvarnished) except for filtering to remove the small bits of detached collodion, and that it is in quite as good working order now as one that I made and put in a porcelain bath a short time ago. I keep a stock bottle of a 40-grain solution of nitrate to replenish my bath when it gets low, and that is all I do with it. I saw, the other day, an extract from a paper (I think the *Athenæum*) which may be interesting to some of your readers. I do not remember seeing it in the News. It is a very simple way of clearing the printing solution of the red colour. You take a 5- or 6-grain solution of salt and water, put a little into the solution of silver, and agitate violently before any precipitate is formed, when the liquid becomes quite limpid; of course you must add a little at a time until the desired effect is produced, taking care to agitate, to prevent the formation of a precipitate.—I remain, sir, your obedient servant, R. W. K. M.

Highgate, April 15, 1861.

[An enquiry as to the best dry process is one we are continually receiving. It might be asked with equal propriety, "which is the best colour for a ribbon?" or anything else on which diversity of opinion prevails, or which for its answer depends upon circumstances. Every dry process has its advocates, and with all we have seen excellent results. The collodio-albumen process has produced the very best pictures we have seen produced by any dry process, we might add or wet either; but it is not quick, and the preparation of the plates takes time. The Fothergill is more simple and sensitive, but less certain. The resin process is the simplest of all, and very sensitive; but there are difficulties in getting good results. The tannin process is very simple, and gives magnificent negatives, but unless carefully managed there is danger of losing the film; and the process is, moreover, stated to be somewhat slow. In reference to this we may remark that we got a very good negative on a tannin plate the other day, in 18 seconds, with a Dallmeyer's lens with half-inch stop. There is no royal road to success in photography, it is only obtained by patiently working any given process out. Mr. Mudd, the most successful "dry" photographer we know, speaking of the secret of his success in the collodio-albumen process, says, "I have worked at it four years, and never tried any other." See the Report of the South London Experimental Committee in the present number.

The use of a solution forming a chloride, a citrate, or other insoluble salt of silver, for decolorizing the nitrate bath is well known.—Ed.]

Horizontal Stops.

Sir,—Much has been written on the cause and remedy of lenses producing distorted pictures, but in my opinion opticians generally begin their investigations upon wrong premises, they appear to take for granted that they must approach in their lenses the condition of a person with one eye, whereas, everyone knows that the two eyes of an individual produce two distinct impressions of an object, one being to the right or left of the other as the case may be, one superimposed on the other, shew the object, not as it really is from one point of sight, but much broader horizontally, as including part of the side or sides of the object, if it be a small one, at a moderate distance off. Now a large lens of the same diameter as the width apart of the two eyes, gives an image of an object not only broader as the eyes do, but also shews more of the top and bottom, as well as between those extreme parts, on every side which a line drawn from any part of the face of the lens could take in, necessarily therefore, a lens to give a true delineation should have a stop with a horizontal slit for opening, corresponding to the width between the pupils of the eyes and of the breadth of the diameter of the pupils. For general purposes the opening may be a little wider. The rays from the object to the part between the extremities of the slit do not matter, as making a less angle they coincide more nearly than the extreme ends. I wrote the substance of the above on a slip of paper, and intended to revise these few remarks, but being apprehensive from what I have heard that some one else may have forestalled me in writing to you, as I invented the stop five weeks since, and have been working with it four or five weeks in my father's public photographic studio, I write at once. Of course there may be a contemporary invention of the same thing. I am, sir, yours respectfully,

James Vincent Maginn.

Manchester, April 15th, 1861.

[We presume our correspondent, although dating from Manchester, is not a member of the Manchester Society. At the March meeting of that society Mr. Sidebotham read a paper on this subject. Mr. Maginn's experiments appear to have been contemporaneous with Mr. Sidebotham's. If the date of such an idea be of any interest, we may state that we tried it some five or six years ago, covering the front of a portrait lens with a piece of brown paper with a horizontal slip in the centre. We arrived then at a similar conclusion to that which Mr. Brothers has come to—we discovered no practical difference, except loss of light.—Ed.]

Correspondence.

FOREIGN SCIENCE.

[From our special correspondent.]

Paris, 17*th April*, 1861.

There is every prospect of a brilliant Exhibition of photographs opening here on the 1st of May. Most of our most eminent photographers, animated with a feeling of national pride, no less than of personal ambition, have exerted themselves to the utmost to render full justice to the present capabilities and resources of the photographic art. All the foreign contributions that will be received, have, of course, now arrived; but at present I am unable to state in what quantity, although there is reason to suppose that the English quota is less than could be wished. Probably, before my next communication is penned, the catalogue of the Exhibition will be printed, and then all doubts and surmises will be set at rest.

Mr. Aichs, of Brussells, has introduced a new metallic alloy, which is much cheaper than red copper, and even lower in price than brass, while it can advantageously replace those metals in naval constructions, and other branches of industry. It has more tenacity than copper or brass, and is less subject to oxidation. It possesses the great advantage of working as well cold as when heated; it may be forged without losing its cohesion; it melts readily, and can afterwards be submitted to the operations of hammering, rolling, and punching. In a state of homogeneous fusion, this alloy consists of 60 parts copper, 38·2 of zinc, and 1·8 of iron.

The conversion of iron into steel has taken another step towards a satisfactory theory of cementation, through the labours and intelligent experiments of Captain Caron. The result of his last researches may be summed up as follows:—1st. That in industrial cementation, acieration is always produced by means of a cyanide, which is formed naturally in the cementation boxes, by the reciprocal action of carbon, nitrogen, and the alkalies present. This is the reason why the presence of nitrogen is indispensable. 2nd. That, nevertheless, under certain circumstances, it is possible to cement without the presence of nitrogen; which proves, *en passant*, that steel is not, as some chemists have attempted to prove, a nitro-carbide of iron. 3rd. That to cement it is necessary and sufficient that the agent of cementation be a volatile or gaseous compound, but indecomposable at the temperature employed; in this manner the carbon is brought to a state of combination in the very pores of the iron where this metal appropriates it in its nascent state. 4th. That native carbonate of baryta, or carbonate of strontium, mixed with carbon is susceptible of becoming one of the most useful and economical agents of cementation, on account of its unalterability and its power. The question of effectual and economical cementation of iron would appear now to have attained a satisfactory solution. The above mixture, once formed, may be employed indefinitely, it will only require the addition of a small quantity of carbon occasionally, to supply the loss of such portions as may be accidentally consumed. The barium, after yielding up its carbon to the iron, becomes regenerated by the oxide of carbon, always present at the same time with nitrogen, in the cementation boxes.

It is considered probable by many chemists that new investigations into the constitution of certain bodies now regarded as simple or elementary will result in showing that they are only compounds. The number at present admitted to be simple does not at all harmonise with the simplicity of means prevalent in the operations of nature. Many probabilities concur to show that certain so-called simple bodies are either condensations or combinations formed by nature under great pressure, sometimes accompanied with high temperature, and by elements upon the simple nature of which there can be no question. It remains to be seen if science cannot experimentally attack, with hope of success, the problem of their composition. We already possess powerful apparatus of compression, we know how to obtain vapours under very great pressure, and compel them either by heat or by chemical process to produce it in relatively small spaces. The depths of the ocean furnish us with facilities for submitting bodies to enormous pressure; and, by electricity or by mixtures, we can excite chemical reactions at great depths below the earth's surface. Thus, it would appear, we have all the recources for attempting the synthesis of certain simple bodies under conditions similar to those which apparently were employed in nature in the formation of most of them. In every group of simple bodies, evidently analagous, every intermediate body possesses a union of properties, presents a type which the body immediately superior and the body immediately inferior can create by contracting one with the other, in suitable proportions, an undecomposable combination. A bromine, for example, is a sort of chloride of iodine; a phosphorus, is a sort of nitride of arsenic; an arsenic, a sort of phosphide of antimony; a selenium, a sort of sulphide of tellurium, and so on. It is not, however, necessary that these bodies should be of the same group to produce such or even more remarkable coincidences. The properties of carbide of nitrogen, C_2N, or cyanogen, so analogous to those of chlorine, leads to the supposition that chlorine may be a nitride, either of carbon or some analogous body, but a nitride undecomposable by any means at present employed. Speaking according to the laws of fusibility, bromine and iodine may have an analogous composition, only either, will be in lesser and lesser proportions, or the carbonoïd radical will be heavier and heavier. At the period when the temperature of the earth was at the melting point for the whole mass, the waters now spread so profusely over its surface formed with a quantity of matters now solid or liquid an atmosphere the pressure of which must have been enormous. When vapours are formed abundantly at great depths below the surface of the earth in spaces completely closed, the pressure they exercise, other things remaining equal, must also be enormous. Physics show this to be the case, and the prodigious force put into action during earthquakes and volcanic eruptions appear to afford an example. These enormous pressures, generally neglected in our chemical reactions, must play a very important part, which appears to be very useful in the question now under consideration. These remarks, however imperfect or incomplete they may appear, will serve to indicate the direction chemical research should take in the investigation of the elementary nature of so-called simple bodies.

Talk in the Studio.

Light in Dark Places.—Our readers are doubtless aware that, until recently, photography was banned in the greater part of Italy as an unhallowed thing. A new era in that as well as many other things is inaugurated under the reign of Victor Emmanuel, King of Italy, and photography is received under especial favour of government. M. Dallmeyer has just received a large order from the new Italian government for lenses, amongst which are two of his triple achromatic combinations, one of 40 inches focus, to take pictures 30 in. by 24 in., and another to take pictures 15 in. by 12 in., and also a portrait combination for pictures 12 in. by 10 in. It is highly gratifying to record the recognition these new lenses are receiving on the continent.

Large Lenses.—The photographic department at South Kensington Museum have just ordered one of the triple achromatic lenses to produce negatives three feet square; they have one in use already covering 25 in. by 21 in.

Lecture on Photography.—Lectures on photography seem for some years to have almost entirely ceased. We are glad to find some hope of their revival in the hands of a gentleman so accomplished as Mr. Vernon Heath, who lectured at Aylesbury, in the Mechanics' Institute, on the 27th ult., the Rev. J. B. Reade, the first photographer in this country, presided. The lecture was illustrated by some interesting experiments. By means of the brilliant light of phosphorus burnt in a jar of oxygen, the word "light" was printed on sensitive paper, and a negative of a bust taken by the aid of the same light.

Stereoscopic Exchange Club.—We regret to state that we have received several letters complaining of the inferiority of many of the prints forwarded as exchanges by some members of the Stereo Exchange Club. One correspondent states that, out of twelve dozen he has received, he cannot select two dozen good pictures; and that in many cases the worthlessness of those received arises out of downright carelessness, as not less than fifteen have been mounted in the wrong position, the left picture on the right side. He adds the significant fact, that most of the bad pictures are by some dry process; whilst the balance of good results are by the wet process. Another correspondendent sends us up specimens of what he has received, some of which are simply disgraceful, and are the worst we have ever seen. We were fully prepared to expect that some poor prints would be sent out in this way, and that possibly in good faith, as some persons, beginners especially, are wonderfully blind to the defects of their own pictures; but some of these are so bad as to admit of no excuse. We really hope that to prevent the entire cessation of this pleasant interchange, members will act with consideration and fairness, and send out nothing in any degree inferior to those which they hope to receive. If, however, the suggestion be acted on which we made sometime ago, we think much disappointment might be prevented. If members in commencing to exchange with any new member begin with one or two copies, and only proceed further on finding that the exchange is likely to be satisfactory, no great harm can at any time be done. This, we think, would prevent disappointment more effectually than any classification which we could make, and would be a much less invidious proceeding.

Copyright in Works of Fine Art.—The Bill for amending the law relating to this subject, which was to have been brought into the House of Commons by the Solicitor-General at the commencement of the Session, was not brought forward until Monday evening last, when the Attorney-General moved for leave to introduce it. He hoped the House would take for granted the necessity for such a Bill. The artists of all nations in the world were invited to bring their works to this country in 1862. We had entered into treaties with other countries and established an international copyright, yet there was not in this country any law that gave protection to copyright in works of the mind, which above all others were entitled to such protection. Leave was given to bring in the Bill, which was then read for the first time.

*** Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

To Correspondents.

J. L.—Bromide of cadmium is moderately soluble in alcohol, much more so than most of the bromides. Bromide of potassium is very sparingly soluble in alcohol: it is difficult to get more than one-fourth of a grain in each ounce of collodion. The best method of adding a bromide is to dissolve it in the iodizing solution before mixing with the collodion. Your stereograph is scarcely up to the mark. It is very much under-exposed. We shall not publish a list for a few weeks, and shall be glad to know that you have got some other negatives in the meantime. The addition of a small portion of bromide to your collodion and iron development will cure the hardness which characterizes your specimen. We must impress upon you and some other correspondents that it is utterly inexcusable to send letters without paying the postage. We had to pay four pence for the privilege of criticizing an imperfect picture.

X. Y. Z. asks us what are the defects of Powell's dry process, as he presumes it has turned out a failure, notwithstanding that he has obtained and seen some good negatives by it. We have not tried it and cannot speak from personal experience; but we believe that similar difficulties were found in the use of glycerrhizine, to those which some have found in the use of tannin, namely the tendency of the film to leave the plate. Whether these were insuperable difficulties or not we cannot tell. Mr. Ackland has, we believe, worked it successfully, and, we fancy, does so occasionally still.

C. S. Trawels.—You will find full details of the manipulations in the tannin process in our numbers for the 15th and 22nd of March.

J. Smith.—The mottled red spots in your print arise from some imperfection in the paper; try another sample. We have produced excellent tones by various alkline gold formulæ. Here is a very simple one which we gave to a pupil the other day, who brought us a day or two after as his first attempt, some as finely-toned prints as we should wish to see: chloride of gold, 1 grain; carbonate of soda, 5 grains; water, 8 ounces. 2. Hypo will keep perfectly well in solution: by new hypo is meant a solution which has not been used, but not necessarily newly prepared. 3. Your silver bath should not be less than 60 grains to the ounce. 4. Take your negatives direct, by one process if you can do so successfully; only use intensifying processes to gain some advantage, not otherwise attainable. See a recent editorial article on intensifying processes. Your lens does not cover sufficiently for a standing figure.

P. L. L.—The shape which prints shall be cut previous to mounting is much a matter of taste, and must be governed largely by the character of the composition. In many cases there is nothing more satisfactory than a simple rectangular shape, such as is given nine times out of ten to drawings and paintings. Sometimes it happens, however, that by the use of the oval circular or dome shape something is got rid of, the absence of which vastly improves the picture; and sometimes the whole effect of the lines in the picture is altered and improved by the shape to which the print is cut. As we have said, it is a matter of taste; but do not imagine from this that we mean that it is purely arbitrary; good taste in such matters arises either from a carefully acquired knowledge of the laws of composition, or from an instinctive perception of them with which some persons are gifted. We have seen in some of Mr. Mudd's pictures, the immense value they acquired from taste and judgment in this respect. At times, where a series of straight vertical lines have been the only defect in a beautiful landscape, that defect has been entirely got rid of by cutting the picture a circular shape.

Proto.—A good rule in making an iron developer, is to use as many minims of glacial acetic acid as there are grains of protosulphate of iron in the solution. No rule can be given for the use of alcohol, as that depends on other conditions: as little as will make the developing solution flow freely and evenly over the plate. Methylated alcohol answers perfectly well in the developing solution; we have used it for years.

Tripod.—As a general rule the camera stand should be of such a height as to allow the lens to be about the same height as the eyes; say about five feet six inches from the ground.

W. H. B.—If the varnish only has cracked, the evil may be remedied by dissolving off the film of varnish by a proper solvent, which only can be determined by the kind of varnish; but if the film of collodion also be cracked, there is no remedy.

W. W.—A very small quantity of dilute nitric acid will prevent the streaks being formed on the film. See also that there is no scum on the top of the solution, as that sometimes will cause streaks; also let the film set well.

Brom. Cad.—Where the pyroxyline has been made at a low temperature, or with very strong acids, cadmium salts have a tendency to gelatinize the collodion. Time will largely remove this defect, and the addition of a little more ether to the collodion will improve it when that gelatinous tendency is shown. The film is generally somewhat paler when the collodion contains a bromide; we generally add extra iodide when we use a bromide. All the bromides are less soluble than the iodides, but bromide of cadmium is easily soluble in alcohol as compared with most other bromides. On adding the bromide of cadmium to a solution of iodide of potassium, the milky turbidity and white precipitate are caused by the formation of bromide of potassium which is very sparingly soluble in alcohol, and is consequently thrown down. Not more than a quarter of a grain of a bromide to each ounce of collodion can be conveniently used in conjunction with a potassium iodizer; but if you add it freely the cadmium base which left the bromide would unite with the iodide, leaving the potassium, and thus you may have a large quantity of cadmium in your collodion, and this with a pyroxyline made at a low temperature, would produce the glutinosity of which you complain.

G. G.—The camera should be polished after it is completed, but before, of course, the lens and flange are in their places. You can buy French polish ready made at the oil shops; or make it by dissolving equal parts of shellac and sandarach in methylated spirits; the proportions we do not remember at this moment, but it must be of about the consistency of cream. Press of other matter more strictly photographic, has prevented the appearance of mechanical articles. It is still in contemplation to reprint and enlarge the articles in question.

M. L.—We will insert your name. The Water Works are very good indeed. The other a little under-exposed. Don't be afraid of exposure with dry plates. We are obliged by your good opinion.

A Lady Photographer and some other correspondents next week.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 138.—*April* 26, 1861.

A NEW PROCESS.

Last week we found it necessary to caution our experimental readers against building hope upon a process originally announced by Mr. Bellini in our columns, and revived when we had forgotten it, in the columns of a French contemporary. We have this week to announce to our readers the discovery of a process, scarcely less startling in its claims than the one to which we have referred, and in one of its features, at least, analagous to it.

Unlike Mr. Bellini's process, this comes before us with credentials, which entitle it to attention; and we can speak personally, so far as very limited time for experiments permits, of its success.

The chief aim of the process is to dispense with the use of a bath of nitrate of silver, or of any other substance, in the production of negatives on glass. A preparation is poured upon the plate, whereby an even, homogenous film is produced, which is sensitive to light, without further treatment of any kind. The exposure and development are then the same as in the ordinary process, either the salts of iron, or pyrogallic acid being used as a developer.

The conception of the idea is due to Captain Dixon, whose photographs of Indian temples and other subjects, many of our readers may remember in the exhibitions of the Photographic Society, and of the Architectural Photographic Association. The details have been worked out, so far as they have gone, by our contributor, Mr. Samuel Fry, in conjunction with Captain Dixon. As we conceive it to be very possible that the germ of a very considerable modification or revolution in the ordinary negative process may spring from this discovery, we may state briefly, in detail, how the matter stands. Mr. Fry called upon us one evening this week and showed us some stereoscopic negatives, and asked for our opinion of their character. They were red vigorous negatives, some of which were much over-exposed. One marked as having had three seconds and a half was slightly under-exposed; and another marked as having been exposed seven seconds was nearly right, but would have done with a second or two less. A portrait combination, with small central stop, had been used. We were then informed that these negatives had been produced without the aid of any bath of nitrate of silver; the sensitive film being produced at one operation by means of a preparation poured on the plate.

The following morning we attended at the laboratory at King's College for the purpose of testing, in conjunction with Mr. Sutton, Mr. Rouch, Mr. Fry, and Captain Dixon, the results of the new preparation. It unfortunately happened that there was a foggy bad light, which rendered photographic experiments comparatively useless. Some pictures were obtained, but they were not perfect.

We have ourselves since taken three or four pictures by means of the preparation. In our hands, so far, it has proved a trifle less sensitive than wet collodion, and there is also a little lack of vigour. We have, just before writing these lines, taken a negative, with an exposure of about forty seconds, without sun, and dull light, a Dallmeyer's portrait lens of about six inches focus, and three-eighths stop. The negative is perfectly full of detail, but a little wanting in vigour.

Much probably remains to be done in settling the precise formula for giving the best results, both as regards sensitiveness and vigour; but we think that it is obvious that a compound, containing in itself all the necessary sensitive salts, in proper proportion and due relation, must possess advantages altogether unattainable by the use of nitrate bath where an uncertain amount of iodide of silver is formed, plus an indefinite quantity of free nitrate, plus an indefinite amount of other unknown matter.

Steps are in progress for patenting the preparation which, by the time these lines are in the hands of our readers, will be completed. The matter will then be put to the practical test, which must decide its worth.

Since the above remarks were written, we have received a letter from Mr. Bellini, which, as it bears upon the question, we may refer to here. Mr. Bellini thinks we have done him injustice in the caution we felt it necessary to give experimentalists, in reference to his alleged discovery. He asks us to suspend judgment until next week, when he will reply, at length, to our remarks. The best reply Mr. Bellini can make is to give actual demonstration. If he has received any injustice, he has only himself to blame. We gave him a fair field, and took some trouble to allow him every opportunity of substantiating his statements. From whatever cause, he did not do so: and the last personal statement he made to us was, that as he had not succeeded in his operations in our presence, he would send us, in a few days, a bottle of his preparation for our own experiment. Six months have now elapsed, and it has not arrived.

MODIFICATION OF THE FOTHERGILL PROCESS.

We call the attention of our readers interested in dry photography to a modification of the Fothergill process, suggested by Mr. Hannaford, by which considerable uniformity of result and immunity from stains is obtained. Instead of adopting the plan of a partial washing, whereby an uncertain amount of nitrate of silver is left in the film, or the use of a second weak silver bath, giving a definite amount of nitrate, but which involves extra trouble, Mr. Hannaford washes the excited film thoroughly in an unlimited amount of water. This being done, there is no silver left to form the albuminate of silver, or other compound of salt, when the preservative is applied. Mr. Hannaford, however, forms that salt, whatever it may be, in his preservative solution, by the addition of a given amount of nitrate of silver to it.

It must be evident that one essential cause of stains and irregular deposit is here eliminated. It is clear that on the application of a preservative solution, forming a compound salt, with the free silver already in the film, a very different result is produced at the first point of contact, to that which occurs when the solution has spread itself to the furthest part of a large plate. In Mr. Hannaford's modification, however, no new compound is formed on or in the plate, but, being applied in one homogeneous solution, an even and harmonious deposit of silver in development is the result. The details are given in the report of the Experimental Committee of the South London Society, published in our last, and in the present number.

It is only just, here to remark, that whilst to Mr. Hannaford is due the careful working out of this plan, the idea was suggested in our columns nearly three months ago by Mr. Bartholomew, of Fareham,* and we have before us an excellent negative taken by that gentleman on a plate prepared by that method. At the time we made a similar suggestion to that made by Mr. Borchert at the South

* See p. 53 of present volume.

London meeting the other evening, namely, that the keeping qualities of the plates would probably be injured. That point yet remains for time to prove. It is due to Mr. Hannaford to say that we believe that the idea was an original one so far as he personally was concerned.

A slight alteration will also be found in Mr. Davis's method of working the collodio-albumen process, in the above-mentioned report, to which we call attention.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Another chloride which is of great use to photographers for several purposes is the *chloride of calcium*. This may readily be obtained in commerce; nevertheless as some of our readers may be so situated as to be unable to procure this salt, whilst they may perhaps have the materials from which to make it, we will follow the same plan that has been adopted with the salts which have come under our notice in previous chapters. It is prepared, on the large scale, in many ways, and is also met with as a by-product in the preparation of caustic and carbonate of ammonia, by the re-action of lime on chloride of ammonium. Amateurs will, however, find it preferable to prepare this salt in a manner which is seldom adopted by manufacturers, from its expense, as the great solubility of chloride of calcium in water will prevent the method of purification by crystallisation, so frequently recommended in these articles, from being employed. Pick out some of the whitest and purest looking lumps of marble that can be obtained, and place them in a moderate-sized evaporating basin. Cover them with a funnel placed upside down over them, with the stem pointing upwards and uncovered. Now pour round the hollow edge of the funnel some pure white hydrochloric acid. This will run under it amongst the marble and will produce a lively effervescence, whilst the funnel will form a covering to prevent the splashes of liquid sent up by the bursting of each bubble of carbonic acid, from falling over to the outside of the dish. As the action of the acid seems to abate, add more, until the marble is nearly all dissolved. Then place it over a source of heat and warm to get rid of the carbonic acid dissolved in the liquid, and afterwards filter it from the impurities which may remain undissolved. Place the clear liquid in an evaporating dish, and evaporate it over the water bath until it is highly concentrated, when cover it up and allow it to cool. Crystals of hydrated chloride of calcium will be deposited on cooling, which must be strained off, allowed to drain in a funnel, quickly dried in blotting paper, and preserved in a well stoppered bottle. These crystals consist of anhydrous chloride of calcium combined with six atoms of water. They are still highly deliquescent, melt below 100° C in their water of crystallisation, and at 200° C fuse and part with four atoms of water, leaving a white porous mass. As this latter compound will be frequently required in the laboratory, it will be advisable to prepare some of it before hand from the crystallised salt, and preserve it in another well stoppered bottle. If this dried salt is heated above the melting point, but still below ignition, the compound swells up strongly and gives off the whole of its water. The anhydrous salt dissolves in water with evolution of heat, but if the crystallised salt be taken, cold is produced. It is, as before stated, extremely deliquescent, 100 parts in powder, absorbing from a damp atmosphere, in 96 days, 124 parts of water. The crystallised salt dissolves in half its weight of ice cold water, in one fourth of its weight at 16° C, and in every proportion of hot water. It is readily soluble in alcohol, both in the dry and hydrated state.

The uses of chloride of calcium to the photographer and scientific man are numerous and important. Owing to its powerful affinity for water, the dry salt forms one of the best materials known for the removal of moisture from liquids as well as from the atmosphere or gases. Thus it has been much employed for separating the water from alcohol and ether, which is easily effected by allowing them to digest together and then distilling. It is also sometimes used for drying the atmosphere of boxes which are destined for the preservation of sensitive paper and plates. For this purpose, however, it is almost too energetic, as it has been found that no advantage, but rather the reverse, is gained by having the air absolutely anhydrous. Its ready solubility in alcohol renders it likewise in great favour amongst some makers of collodion, as it offers an easy means of introducing in this article a certain quantity of chlorine. The deliquescent nature of the salt, and the great mess it makes if any of it is spilled about on the table or floor, are objections in the way of its general use. The crystals reduced to powder, are largely employed in the production of artificial cold, by being mixed with pounded ice or snow; a temperature sufficient to freeze mercury being readily obtained.

Another compound containing calcium and chlorine may conveniently be noticed here—the substance known as *chloride of lime*. This important substance is prepared on a large scale by saturating well slaked lime with chlorine gas, rise of temperature being avoided. The chlorine is prepared from peroxide of manganese, common salt, and sulphuric acid, heated together in a cast iron or leaden vessel, and the evolved chlorine passed into large chambers containing the lime. Thus prepared, chloride of lime is a white powder usually moist and smelling slightly of hypochlorous acid. Its composition is not known with absolute certainty, but it most probably consists of equal equivalents of chloride of calcium ($Ca\ Cl$), and hypochlorite of lime ($CaO.\ ClO$). If properly prepared it contains nearly the theoretical quantity of chlorine to form the above, but never the exact amount, because either more or less of the lime remains uncombined. Chloride of lime must be preserved in well closed vessels kept cool and away from the light; exposed to the air it soon attracts moisture and finally deliquesces, slowly evolving oxygen gas, and forming a liquid which no longer bleaches. In solution chloride of lime forms a transparent and colourless liquid, known under the name of bleaching liquid, having a slight odour of hypochlorous acid, and an astringent taste; when boiled, it loses its bleaching power, and even in close vessels at ordinary temperatures the liquid slowly evolves oxygen gas, especially if exposed to light. All acids, even carbonic, convert it into a lime salt and free chlorine, if added in sufficient quantity; they also give rise to the evolution of hypochlorous acid. Bleaching liquid destroys organic colours, and the odour of decomposing organic matter, but only in the presence of an acid which sets the chlorine free. The value of chloride of lime for removing bad smells arising from putrifying organic matter is well known. The photographer who works with albumen and other animal or vegetable matters, will find it advisable to clean with this substance the floor, &c., upon which such organic liquids fall, and also to throw some frequently down the sink, as nothing tends to the failure of photographic operations so much as the presence of disagreeable odours in the room. It must, however, be borne in mind that the vapour from chloride of lime is injurious to sensitiveness, and it should therefore be guarded against.

Another chloride which is sometimes used in photography is the *chloride of magnesium*. This may readily be formed by dissolving magnesia alba in dilute hydrochloric acid, and evaporating the solution. It crystallizes with difficulty in needles and prisms, and has a sharp bitter taste. It is deliquescent in the air, dissolves in less than its own weight of cold water, in five parts of alcohol, sp. gr. 90°, and in two parts of alcohol of sp. gr. ·817. It will be pure if prepared with pure materials, but its purification, if impure, would be a matter of considerable difficulty to one unaccustomed to the details of chemical manipulation, and should not, therefore, be attempted by the amateur. Pure magnesia and hydrochloric acid are readily to be got free from impurity.

Chloride of cadmium is prepared by saturating dilute hydrochloric acid with either metallic cadmium or its oxide, then filtering and evaporating to the crystallizing point. It forms transparent rectangular prisms, which deliquesce readily when heated, and are readily soluble in water. They may be purified by straining from the mother liquor, in which they have crystallized, and then dissolving in a fresh quantity of water and recrystallizing. The anhydrous salt may be prepared by heating the crystals to the fusing point; it then presents the appearance of a transparent mass, having a pearly, metallic lustre, and laminated texture. It is somewhat soluble in alcohol, although not so much so as the iodide or bromide of cadmium, or some of the chlorides we have just treated of.

Chloride of silver is so well known to the photographer that a lengthened account of it may appear unnecessary, nevertheless, an account of its formation and principal properties will properly follow the descriptions of the other chlorides. Chloride of silver is formed by precipitating the nitrate with common salt or hydrochloric acid, and washing the curdy, white precipitate. It fuses at a temperature below redness, forming an orange yellow transparent liquid, and volatilizes unchanged at a higher temperature. It is also formed by the action of hydrochloric acid, or of solutions of chlorides, upon all salts of oxide of silver, even those which are insoluble in water.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Bright or Brilliant.—Terms sometimes used to express a picture's luminous character; but the quality so described is really the effect of a combination of others, resulting from the judicious arrangement of light and shade in securing a focus of both the one and the other in such positions as may by contrast improve both; giving the light increased brilliancy, and the shade greater apparent depth. I have already urged an extremely careful use of both white and black as the extremes of a photograph's scale of tones, and shown that a waste of the power so given is destructive of a *bright* or *brilliant* effect. Nothing is more productive of brilliancy than a breadth of chiaroscuro, which almost necessitates the preservation of a focus of light, and one of dark. Even and uniform tones produce a monotonous appearance which is the reverse of "bright" or "brilliant," as we must all know; and too much white, or too much black in a picture, will produce the same want of luminous effect by destroying the pictorial foci. The glittering effects of polished metal given by the sharp and direct contrast of the focus of light, and the focus of dark, may serve to illustrate my meaning. In representing this we have only the ordinary black and white, but the first will appear of greater depth, and the second more bright, than the same pigments in other positions, simply because they are brought more directly into contrast. Of course this is an extreme case, but it illustrates very pointedly the value of white and black as the foci of a monochrome picture's tones. The skilful application of this rule will bring all a photographer's art-knowledge into play, and very probably necessitate no little head-work; but the result will most certainly fully repay him for his pains, and, as I have so repeatedly said, tend to raise his art in the estimation of a public powerfully influenced against photography as anything but a mere mechanical process to be classified with—well, I need say no more, you have doubtless seen where our sage friends in authority will place it in the next great exhibition. Dear, dear me; how blind are those who will not see!

Brasses.—Metal plates upon which were represented armorial bearings, portraits of the deceased's figure and costume, or religious emblems, with appropriate inscriptions. As chronicles of costume, evidence of ancestry, and historical relics, these possess very great interest. Photography has been applied to the re-production of these plates by Mr. John Louch. This gentleman's method of proceeding, we extract from an article which appeared some time since in our contemporary, *The British Journal*:—"From an ordinary rubbing, a negative is formed in the pressure frame by exposure to light, and this is fixed and waxed in the ordinary manner. Sensitized chloride papers are then exposed under the negative until the parts which are bright in the original 'brass' are thoroughly *bronzed*, and the parts corresponding to the *blacks* of the negative (that is the *lights* in the positive print) have become black from very extended over-exposure. A dense and well defined negative is that best to operate with; and the positive paper should be both rich in chloride, and also in free nitrate of silver, but not highly albumenized. The printing should be slowly performed in diffused light. The proof then requires fixing and toning with gold, the bath being tolerably rich in the latter material: the effect produced being to *deposit the gold in a metallic form* upon the bronzed portions of the proof, while the other parts acquire a rich black colour, so that the finished specimen bears a striking resemblance to the original 'brass.'"

Buhl-work.—A kind of ornamental furniture frequently introduced into pictures, from its fashionable and picturesque character, and from being generally so designed as to supply a great variety of elegant and contrasting lines, which materially aid composition.

Cabinet-pictures.—Applied to small highly-finished works, which, in consequence of their size, are hung near the eye, and inspected closely.

Caricature.—Photography has been applied to this branch of art, with no small success, by Rejlander; and very ludicrous effects have been got by photographing from distorting mirrors, &c.

Character.—Every individual object in nature having its own peculiar character, it is important that such should not only be preserved, but that it should also be conspicuously visible; for instance, qualities which are characteristic of nearness should be found in the foreground, and those which indicate remoteness should have their place in the distance, instead of aiming by choice of collodion and development, combined with the mismanagement of a lens, to bring the distance forward with clear, *sharp* details, and throw back the foreground by a *comparative* loss of vigour and definition (all that the former gains being invariably at the expense of the latter.) The character of sunlight is frequently destroyed by an over-intense negative, which tends rather to convert the thoroughly diffused brilliancy of solar illumination into the patchy, ghastly lights, and intense shadows of moonlight. Again the peculiar character of flesh, with its glossy and downy surface, its semi-transparency, and its just proportions of yielding softness and firmness, demand for its proper representation all the photographer's judgment and skill: and how seldom do we see this exquisite surface truthfully represented in the photograph. T. R. Williams' pictures are the best I know for giving flesh its own true and peculiarly beautiful character, but he stands almost alone. It is the same in painting, *flesh*-painters are remarkably scarce. It would not take you very long to name all the artists whose painted flesh deserves the name. Before quitting this subject, however, I will just add a few hints relative to a proper representation of the character of water, an element which is almost as seldom represented truthfully in the photograph as proper atmospherical effects. The ripple, or "jaugle,"* of water, may convey the idea of opacity, if it be so photographed as to present only the shadowed side of the ridges to the spectators. But if such a point of view is selected as secures, to some extent, both the lighted and shadowed portions, the result will certainly be more characteristic. This will be mainly influenced by the height of your camera, or rather its tripod stand. Rippled water is best photographed in light, while calm, clear water, is best taken in shadow; the former, when in shadow, losing the very expressive and valuable character

* A nautical term.

of transparency and depth; and the latter, when too strongly illuminated, producing solarization in your exposed plate. Upon any highly polished, smooth, transparent surface, it is very difficult to obtain strong contrasts of light and shade: for this reason, an extensive sheet of smooth water requires very careful management to secure pictorial effect, although such a surface, reflecting light less powerfully than rippled water, is frequently more successfully photographed. The camera's point of elevation is a very important subject of consideration when photographing the surface of water. Reflections in water are most valuable aids in securing its true character, and it may therefore be well for the photographic operator to remember that, on rippled water, such reflections may be visible or not, according to the position occupied by the camera; and also that, by the same means, reflections may be lengthened or shortened. Reflections on rippled water fall only on one side of the ridges, consequently, if your camera gets its view from the opposite side, they will be lost. I have frequently seen water represented as a glaring patch of white paper, when the operator, by simply raising his instrument, might have brought the reflection of a mass of green foliage down into his water, by which the surface would have been materially altered, so far as its photographic results were concerned. Reflections so vary from different points of view, that the artistic photographer should select such when taking this very difficult element with the most earnest care and careful consideration. The nearer the level of the camera is to the surface of the water, the less visible will all the reflections become. As a rule, the ray which pertains to reflection, and that of incidence, according to the laws of perspective, form equal angles. This may be studied from a looking-glass with advantage. I am loath to quit this subject, because so much remains to be said; but I have other duties which are just now crowding every hour of my time, and so perforce must conclude, merely urging upon my readers the importance of considering the characteristics of the things they represent, as well and as thoroughly as the means by which they are represented. There is a great difference between *seeing* and *observing*, you know; and the eye must be educated through the mind to understand imitative art, just as the ear is educated through the mind before it understands musical art. If I do not recognise the thing I seek when it is before me, I have small chance of being rewarded for the search.

ENLARGING SMALL PHOTOGRAPHS.

A Simple Means of producing Enlarged Copies of Pistolgrams, or other Small Photographs.

BY T. SKAIFE.*

A microscopic photograph, whether under the name of pistolgram or otherwise, although generally appreciated for its *multum in parvo* properties, by eyes that luxuriate in small print, yet as "change comes o'er the spirit of the dream," so it is with the idol of affection, whose image secreted in a little gold locket, is there exclusively worshipped by one devotee.

But when the beloved one merges into *Paterfamilias*, so does his image require an amplification of proportion, not only to meet the necessities of patriarchal eyes, but to be in keeping with the patriarchal gallery. Here, our art science has stopped short, to the satisfaction of sundry artist painters no doubt, but not equally so to those who would see in the life-sized family portrait that truthfulness perceived in the miniature photograph.

To meet this want, photographers are now taxing their ingenuity, and using enlarging cameras with more or less success.

Chiefest, perhaps, among the enlarging species is Woodward's solar camera, but which so well adapted for sunny Egypt, or Brighton during the "dog-days," stands small chance of being appreciated in the neighbourhood of London smoke, while the sun is walking south of the Equinox.

To a modification of the electric light, the hopes of the cloud-capped and fogged photographers now turned. But not to waste time in anticipation of the epoch, when the sun is to be outshone at noon-day, I have trimmed me a chamber lamp, which, with its complement of wick and oil, costs sixpence. This on being lit, and placed within the focus of a glass reflector, can have the image of its flame reflected upon the surface of a pistolgram. Now supposing an enlarged reproduction is required from the small photograph, I replace it in the back of the pistolgraph, which I pose opposite the reflector, at a distance from the latter of about double its radius, and place the lamp midway, or nearly so, between the two, moving the lamp backward or forward until the pistolgram becomes brilliantly illumined. Now if a white screen be placed in front of the pistolgraph (from which the shutters have been removed) say at the distance of three feet, an enlarged picture will appear projected thereon *à la* magic lantern. Beneath the screen upon which the magic photograph is projected I place a second table *vis à vis*, the first upon which stands the pistolgraph, lamp, and reflector, a sufficient space being left between the two tables to admit of the operator and his chair.

Upon the second table I place a drawing-board, fixed perpendicularly in a foot, which, when viewed in profile, has the form of a ⊥ square. In this instance my drawing-board, you will perceive, is a stout mahogany picture-frame, across the back of which two pieces of wood are screwed, so as to form a groove into which the frame is pressed. On the plate-glass in the frame, I fix a sheet of drawing or common cartridge paper, by the two upper corners, with a little gum. This done, I next decide on the size of the required enlargement, sliding the drawing-frame nearer or farther from the pistolgraph, and obtaining a proper focus that way, or by turning in or out the screw of the lens.

I then take a small sable pencil dipped in a little neutral water tint, and pass it over all the light parts of the picture, repeating the process until the illumined parts have attained the shaded density of the shadows. Which done, on bringing a light to the front of the lens, an imitation photograph will be found to be the result. And although this imitation, if hastily done, will be found wanting in some of the minor details of the original, the deficiency will be more than compensated by the better adaptation of the imitation than the genuine photograph to receive colour thereon when applied by the skilful touch of an accomplished artist. For the material upon which most artists prefer to paint, whether in oil or water colour, is not generally that best adapted for a photograph, and *vice versâ*. Nor does experience prove that a painting, whether done in water or oil on a photographic base is as durable as one otherwise painted.

Formerly the Messrs. Dickenson, of Bond Street, whose pictures from photographs have attained to such high celebrity, painted, upon the photograph; but in consequence of the numerous complaints made of the fading of pictures so painted, I was informed some months ago by one of the firm, that they had abandoned that system, and now employed competent artists to copy all their best photographic portraits by hand when intended to be finished in colour from the life. The experience of the Messrs. Dickenson, coupled with that of others, added to the no small trouble entailed in obtaining an enlarged negative from a micrograph, has induced me to adopt the plan just described, which, where only one or two enlarged reproductions are required for artistic purposes, answers excellently. A great saving of time being effected thereby, as the head of a child, or other subject, which would take a skilful artist many hours to copy and enlarge by the unassisted eye and hand, could by the magic lantern means be copied more correctly in one quarter of the time.

[Here Mr. Skaife placed a photographic portrait on glass, the size of a small finger-nail, in the back of the pistolgraph,

* Read at the meeting of the Blackheath Society, April 15th, 1861.

then lighting his small lamp (the gas being turned down) an enlarged picture was perceived on the drawing-board screen, which was increased up to life size or diminished accordingly as the screen was slid backward or forward. Finally, adjusting the focus to about half life-size, he passed a small sable pencil charged with a shade tint rapidly over the distinctive light parts of the picture for a few seconds, then slightly turning the lid of the box upon which the magic lantern apparatus stood, the enlarged negative image appeared to slide off the sketch like a mask, revealing the progress of the sketch in contact with the parent negative standing close by.]

You see it is not necessary that the enlarging copyist should be a draughtsman in the artistic sense of the word, although before the mere photographic imitation can rank as a work of art, the mesmerising hand of an artist must pass over it.

THIRD REPORT OF THE EXPERIMENTAL COMMITTEE OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.*

Mr. Davis's Collodio-Albumen Process.

This formula is described by those of the Committee who have tried it as being extremely simple and certain, producing the best results, although at a trifling loss of sensitiveness. By thoroughly washing the film in common water Mr. Davis concludes that every particle of the free nitrate is either removed or converted into an insoluble salt of silver; so that on the application of the preservative no combination of silver with albumen is formed. Intensity is secured by the addition of glucose.

The Particulars of Manipulation, as given by Mr. Davis, are as follows :—

In the second communication from the Experimental Committee a formula was was given for a sensitizing solution which I found to work very satisfactorily when added to a suitable plain collodion. I will, however, take this opportunity of remarking, that any collodion that combines with an appropriate mechanical structure, the capacity of giving an abundance of half tone, is equally suitable for this as any other dry process. The plate after having been covered with such a collodion is to be excited in the usual 35-grain nitrate of silver bath, and then to be washed freely in a dish (or otherwise) with two or three quantities of common filtered water. In cases when the ordinary water contains organic impurities, it will be found preferable to wash with a very dilute solution of chloride of ammonium in distilled water. The film is now to be covered with the following preservative mixture :—

Albumen	1 ounce
Ammonia	10 minims
Glucose	¼ ounce
Water	1 „

Dissolve the glucose in the first instance in the water, next filter, and then add it to the albumen, previously well beaten or otherwise frothed. This preservative solution will keep for a lengthened period, and after having been prepared for a few days, will readily filter through common filtering paper. This latter operation should be repeated immediately before applying it to the plate, the liquid should then possess the brilliancy and appearance of amber-coloured collodion. Pour the first quantity along one edge of the plate, allow it to flow towards the other in a continuous wave, and pour off from one of the corners; recover with a second quantity, which should remain thereupon for about a minute. The plate is then to be washed freely with water, and stand on end to dry.

Gelatine Process.

This process is capable of producing good results, but it is not so generally a favourite with the Committee as those previously described.

Particulars of Manipulation.— Well wash the excited plate and then coat with a solution of gelatine, made by dissolving 80 grains of gelatine in a pint of water, and boiling down to half the quantity, filtering, and when cooled a little, adding 1 oz. of alcohol. This solution must be heated upon being applied, which is most conveniently done by standing the bottle containing it in a jug of warm water.

The Tannin Process.

From this process having so recently come before the public, the Committee have not had opportunity to test it to the extent they desire. Mr. Davis remarks respecting it, "The simplicity and readiness with which the latent image can be developed commends it to a full experimental consideration. The necessity of rendering the film sufficiently adherent to the glass when working upon medium size (10×8) plates without complicating the process; and the lengthened exposure required under the same conditions, over the obvious difficulties to be surmounted in connection with this process." Mr. Borchert recommends a five-grain solution only, as he considers the tendency of the film to wash away to be less in that case than when using a stronger solution of tannin. He adds "all preparations containing tannin (as leather) are very apt, in a dampish atmosphere, to engender fungus. This will have something to do with the keeping qualities. I have noticed marks of fungus in old gelatine plates although they were put perfectly dry into the boxes."

Pending the publication of the promised treatise, by Major Russell, the Commmittee reseve their opinion on this process, only adding the following remarks by Mr. Hannaford :—" Collodion for tannin prints may be of two directly opposite kinds.—The first, and probably the best, partakes of the 'mealy' nature to a very great extent, almost approaching to rottenness; this sample will be found to adhere to the glass with tolerable firmness. It should be strongly bromidised, and the alcohol and ether should contain as much water as possible.

"The second collodion may be of directly the opposite character. I have prepared a sample giving good results, which is so firm that the film can almost be lifted from the glass without breaking. It contains but a small quantity of water and very little bromide. This sample on being varnished round the edges, will bear a considerable amount of washing."

Particulars of Manipulation.—Thoroughly wash the sensitized plate, so as to remove every trace of nitrate of silver, coat with solution of tannin, 5 to 20 grains to the ounce. Dry as usual.

There is so much in this process that is promising, that the Committee propose giving it a fair practical trial during the coming summer months.

General Processes.

The Committee having now entered at some length into those processes which they consider the best, it will be sufficient, perhaps, to allude but shortly to some others which have been placed before the public from time to time.

The malt, glucose, linseed, raspberry syrup, metagelatine, &c. processes are each capable of yielding good results, but are severally open to the objection that the preservative media do not assist in retaining the collodion film in contact with the surface of the glass.

The resin process, from its extreme simplicity, is well worthy of attention. It has not yet received sufficient trial from the Committee to be spoken of with certainty.

Concluding Remarks.

In this report the Committee have given what in their experience has proved the best formula in the several dry processes which they consider will be most generally followed.

As a body they are inclined to give the preference, and recommend the Fothergill and Mr, Davis's processes; the tannin process, and Mr. Hannaford's modification of the Fothergill, they consider promising, but would at present more particularly call the attention of the experimental Members of the Sociefy to them.

* Continued from p. 183.

During the summer months the Committee purpose continuing their experiments in the preparation of extra sensitive plates. They, however, only attempted to report on the good working process, from which the Members of the Society may make a selection, now that the season for outdoor work has commenced.

PRINTING BY DEVELOPMENT.

BY LYNDON SMITH.

The last number of Photographic Notes contains a communication from Mr. Lyndon Smith, detailing some modifications he has made in the process of printing by development. He states at the outset that he mainly uses the formulæ of Mr. Sutton, the chief difference being the substitution of pyrogallic for gallic acid. He proceeds as follows:—

First, then, as to the paper. I obtain the best results on Canson's Positive, but Turner's Calotype gives good prints. Immerse the papers in this solution.

Common salt	160 grains.
Hydrochloric acid	10 drops.
Rain water	20 oz.

Let them soak some hours, that the acid may act thoroughly. On no account omit the acid, it is essential to success with Canson's paper; if you use Turner's you may omit it. Excite by floating on a bath (in yellow light of course).

Nitrate of silver	50 grains.
Citric acid	1 „
Water	1 oz.

Allow the paper three minutes, then hang up to dry, suspending with American clips—*not pins*—by *two* corners; put a slip of blotting paper along the bottom. Let the paper become *surface* dry, and while it is still damp, place in contact with the negative as usual, and expose to light till there is a faint image, give, say 3 seconds in full sunshine, and 90 or 100 seconds in dull weather, till experience shows you the exact time, which varies with every negative. Return to the dark room and develop as follows:—Turn up the edges of the print and make it into a tray, and lay it on a sheet of blotting paper; then in a clean measure-glass put a sufficient quantity of the solution,—say 1 oz. for a 10×8 print.

Pyrogallic acid	2 grains.
Citric acid	1 „
Water	1 oz.

Take the measure-glass in the left hand, and a glass triangle in the right, and pour the solution smartly down one side of the tray, and with the triangle spread the liquid cleverly all over the paper; this operation requires some practice, for if not performed neatly, the picture will be stained, just as a collodion negative would be. The picture developes very quickly, in about the same time as a collodion negative, and must be *closely watched*. If all is right, the deep shadows come up first, and strengthen considerably before the half tones and finer details of the high lights show themselves; as soon as it looks vigorous and powerful enough—recollect the fixing *does not reduce the print at all*—take hold of the tray by two corners, and turn the developing solution into the waste pan, and wash the print well under the tap, then fix in

Hypo soda	1 oz.
Water	1 pint.

letting the proof remain 20 minutes or half an hour in the bath; afterwards wash as usual; though I don't wash *as usual*, for I douse the print with a heavy stream of water from a piece of India rubber tubing attached to the tap, where I have a heavy pressure. I squeeze the tubing between my fingers, so as to make the water *fizz* out—I can't explain better—and direct the stream on the print which lies on the bottom of the wooden sink, turn it over repeatedly, let it soak half an hour, repeat the dousing, then take it out and dry. I think this is just as effectual in getting rid of the hypo, as soaking many hours, which softens the paper and dims the picture.

I have now detailed a process of printing positive photographs, at once simple and elegant; the proofs are as vigorous and powerful as could be desired; they can be turned out with great rapidity, and are of undisputed permanence; of their merits, artistically, I would rather leave it to you to decide. I will just make a few remarks on some points of the process. First, as regards the hydrochloric acid in the salting solution. If you try Canson's paper without the acid, it is almost impossible to get a clean vigorous print: it developes muddy, feeble, and bad in every respect: *with* the acid there is a marvellous difference; it seems to have opened the pores of the paper, and cleansed it from impurities, so that the picture comes up as bright and clear as it was dirty and feeble in the other case. But I cannot agree with you that the acid does not affect the delicacy of the proof, for I fancy it roughens the surface somewhat. I have tried lemon juice in the silver bath instead of citric acid, but cannot see any advantage in it. The *quantity* of acid in the bath is of the utmost importance: with *none* at all you cannot control the development: with too much there is no half-tone; therefore it is of importance to be careful in the addition of acid to the silver bath, and it seems as if great differences of tone and quality may be got by regulating the acid according to the density of the negative. This is a point that requires further working out. Care must be taken to keep the silver bath up to the proper strength. The development is a beautiful operation, the picture seems to spring out. I like printing now as much as I detested it before, for it is not a mechanical process as the common method is, but one which requires judgment and skill to conduct properly.

[We may remark that we have seen a print produced by Mr. Sutton, from a very fine negative by Major Stuart Wortley, by Mr. Smith's modification. The colour was good, and the print, whilst wet, was very rich, but sunk considerably on drying. This might be due. Mr. Sutton observed, to the fact that he had used more citric acid than was given in the formula.—Ed.]

THE STEREOTROPE.

The following description of Mr. Shaw's stereoscopic thaumatrope was recently communicated to the Royal Society by Mr. Warren De la Rue:—

"This instrument is an application of the principle of the stereoscope to that class of instruments variously termed thaumatropes, phantascopes, phenakistoscopes, &c., which depend for their results on 'persistence of vision.' In these instruments, as is well known, an object represented on a revolving disc, in the successive positions it assumes in performing a given evolution, is seen to execute the movement so delineated; in the stereotrope the effect of solidity is superadded, so that the object is perceived as if in motion and with an appearance of relief as in nature. The following is the manner in which I adapt to this purpose the refracting form of the stereoscope.

"Having procured eight stereoscopic pictures of an object—of a steam-engine for example—in the successive positions it assumes in completing a revolution, I affix them, in the order in which they were taken, to an octagonal drum, which revolves on a horizontal axis beneath an ordinary lenticular stereoscope and brings them one after another into view. Immediately beneath the lenses, and with its axis situated half an inch from the plane of sight, is fixed a solid cylinder, 4 inches in diameter, capable of being moved freely on its axis. This cylinder, which is called the eye-cylinder, is pierced throughout its entire length (if we except a diaphragm in the centre inserted for obvious reasons) by two apertures, of such a shape, and so situated relatively to each other, that a transverse section of the cylinder shows them as cones, with their apices pointing in opposite directions, and with their axes parallel to, and distant half an inch from, the diameter of the cylinder. Attached to the axis of the eye-cylinder is a pulley, exactly one-fourth the size of a similar pulley affixed to the axis of the picture-drum, with which it is connected by means of an endless band. The eye-cylinder thus making four revolutions to one of the picture-drum, it is evident that the axes of its apertures will respectively coincide with the plane of sight four times in one complete revolution of the instrument, and that, consequently, vision will be permitted eight times, or once for each picture.

"The cylinder is so placed that at the time of vision the *large* ends of the apertures are next the eyes, the effect of which is that when the *small* ends pass the eyes, the axes of the apertures, by reason of their eccentricity, do not coincide with the plane of sight, and vision is therefore impossible. If, however, the position of the cylinder be reversed end for end, vision will be possible only when the small ends are next the eyes, and the angle of the aperture will be found to subtend exactly the pencil of rays coming from a picture, which is so placed as to be bisected at right angles by the plane of sight. Hence it follows that, the former arrangement of the cylinder being reverted to, the observer looking along the upper side of the aperture will see a narrow strip extending along the top of the picture; then, moving the cylinder on and looking along the lower side of the aperture, he will see a similar strip at the bottom of the picture; consequently, in the intermediate positions of the aperture, the other parts of the picture will have been projected on the retinæ. The width of these strips is determined by that of the small ends of the apertures, which measure ·125 inch; and the diameter of the large ends is 1·5 inch, the lenses being distant 9 inches from the pictures. The picture-drum being caused to revolve with the requisite rapidity, the observer will see the steam-engine constantly before him, its position remaining unchanged in respect of space, but its parts will appear to be in motion and in solid relief, as in the veritable object. The stationary appearance of the pictures, notwithstanding the fact of their being in rapid motion, is brought about by causing their corresponding parts to be seen, respectively, *only* in the same part of space, and *that* for so short a time that while in view they make no sensible progression. As, however, there is an actual progression during the instant of vision, it is needful to take that fact into account—in order that it may be reduced as far as practicable—in regulating the diameter of the eye-cylinder, and of the apertures at their small ends; and the following are the numerical data involved in the construction of an instrument with the relative proportions given above:—

"The circumference of picture-drum $=22·5$ inches (A).

"The circumference of eye-cylinder $=12$ inches $\times$ 4 revolutions $=48$ inches (B).

"The diameter of apertures at large ends $=1·5$ inch (C).

"The diameter of apertures at small ends $=·125$ inch (D).

"While the large end is passing the eye, the picture under view progresses $\frac{1·5}{48}\begin{matrix}(C)\\(B)\end{matrix}$ of 22·5 (A), or ·703 inch.

"This amount of progression (·703 in.), if perceived at one and the same instant, would be utterly destructive of all distinctness of definition; but it is evident that the total movement brought under visual observation at any one moment is $\frac{·125\ (D)}{1·5\ (C)}$ of ·703 inch, or ·058 inch. This movement must necessarily occasion a corresponding slurring, so to speak, of the images on the retinæ; and the fact of such slurring not affecting, to an appreciable extent, the distinctness of definition, seems to be referable to a faculty which the mind has of correcting or disregarding certain discrepant appearances or irregularities in the organ of vision; as a further illustration of which I may cite the fact, mentioned by Mr. Warren De la Rue in his 'Report on Celestial Photography,' that the retinal image of a star is, at least under some atmospheric conditions, made up of 'a great number of undulating points,' which, however, the mind rightly interprets as the effect of the presence before the eye of a single minute object. That this corrective power is, as might be supposed, very limited, may be proved experimentally by this instrument; for if the small ends be enlarged in only a slight degree, so as to increase this slurring on the retinæ, a very marked diminution in clearness of definition is the immediate result.

"That form of the stereotrope, in which Professor Wheatstone's reflecting stereoscope is made use of, and which is better adapted for the exhibition of movements that are not only local but progressive in space, it is needless to describe here, because the principles it involves are essentially the same as those which are stated above.

WET COLLODION WITHOUT WATER.

BY COLEMAM SELLERS.

As an earnest advocate of the wet process—though an enemy of water to be carried up steep hills in a bucket—I hope all photographers will excuse me for forcing on them the results of my experiments in working the wet collodion process without the use of water in the field.

It is the custom of many operators to develop in the field, and, after a slight washing, to take the plates home to be cleared and strengthened. After the developer has been washed off, the plate may be allowed to dry and remain any length of time before clearing without injury. But if the iron be not washed off it will, in drying, crystallize and injure the film, also rust and make yellow stains. If there has been iron enough put on in the first place to decompose all the free nitrate of silver on the surface, the image will be developed, and the iodide of silver rendered insensible to light by the removal of the nitrate.

If now, after the iron solution has been poured off, we flow the plate with glycerine, it can be brought into the light, and, if kept in a horizontal position, the film will remain wet for several days, and can be finished at your leisure, as well as if fresh from the camera. Glycerine possesses the valuable property of being very slow to dry (if it will dry at all), is very soluble in water, covers the plate as a varnish, prevents the iron from oxidizing and penetrating the collodion, and destroys all tendency to peel up during washing and clearing. The iron solution I use is strong, being made of four ounces of proto-sulphate of iron; thirty-two ounces of water; one and a half ounce of alcohol. The amount of chemicals required to be carried for a day's work, where my glycerine process is used for stereoscopic photographs, cousists of four ounces of collodion; ten ounces of iron solution, as above; two ounces of acetic acid; two ounces of Price's glycerine.

A box should be prepared to hold the wet collodion negatives, so arranged with grooves that the plates can be carried in a horizontal position with the film side up. The only caution to be observed, is to drain off the iron solution before pouring on the glycerine, as the latter will be economised by so doing.—*Humphrey's Journal.*

Proceedings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The annual meeting was held at the Golf Club House, April 15th, 1861, C. Heisch, Esq., F.C.S., the President of the Society, in the chair.

The minutes of the last meeting were read and confirmed. Messrs. H. Williams, and A. J. Melhuish were appointed auditors, and proceeded to examine the accounts while Mr. Skaife prepared his apparatus for illustrating his paper on a means of producing enlarged copies of pistolgrams or other small photographs.

After justifying the name pistolgram, which had been attacked in some of the journals, Mr. Skaife read his paper. (See p. 196.)

The Chairman said that Mr. Skaife's was one among many applications of what he thought a very important principle, viz., enlarging from small photographs; he had been giving much attention to that subject lately, not like Mr. Skaife, with a view of copying by hand, but for two purposes; one the enlargement of small pictures photographically, so as to do away with the necessity of carrying about large apparatus, and another which he thought would prove very useful for class-room illustration. It was often desirable to show microscopic objects to a class, of course this can be done with the oxhydrogen microscope; but when one or two only had to be shown in a lecture, this was not worth while. He had lately made some enlarged photographs of microscopic objects, printed transparent positives from them on dry plates, and then exhibited them in the manner Mr. Skaife had just done with his negatives by means of a lamp and a short-focussed portrait lens. He used a camphine or paraffin lamp with a bull's-eye condensor.

All objects of which satisfactory photographs could be obtained, even very moderately magnified (the number of which was, of course, very limited, as only very flat objects could be so copied), might be thus well exhibited. He had intended to exhibit some such objects to the society this evening, but he had been too much engaged to get them ready; he might mention that he had one of a louse, the original photograph of which was about one inch in length, and it could, with the lamp he had mentioned, be magnified to upwards of a foot without losing the smallest detail.

Mr. Melhuish asked if the Chairman thought enlarged photographs would ever rival in sharpness a really good negative, taken at once of its full size, he had never seen anything at all like this in an enlarged picture.

The Chairman said he thought if the enlargement were not pushed too far the pictures would lose nothing by the process. He believed a stereoscopic picture might be enlarged to a 12×10 without loss by proper management. One reason why many enlarged photographs were so wanting in sharpness he believed to be, that almost all who had tried it had used such long-focussed lenses: he had been using Ross's small single stereoscopic lenses, turned, of course, hindside before, and he hoped soon to produce some enlarged negatives, quite as sharp as any taken originally of a large size. He believed the best plan was to let the direct light of the sky fall down through the negative or rather through a transparent positive printed by superposition from the small negative, and not to attempt to work with direct sunlight, which made more complicated arrangements necessary.

Mr. Melhuish asked what time the Chairman thought it would require to take such an enlarged copy as he had mentioned. In all his (Mr. Melhuish's) attempts at enlargement the time required had been so great as to render the process practically useless, when the lens had to be stopped down sufficiently to give anything like sharpness.

The Chairman said he could not say very positively, but he thought from three to five minutes at the outside.

After some further discussion a vote of thanks was tendered to Mr. Skaife for his paper, and the Chairman proceeded to read the annual report of the society, which was, after a short discussion, adopted. The report was as follows:—

REPORT OF THE COUNCIL.

In presenting this their Fourth Annual Report, the Council feel that they have cause both for congratulation and regret. They can congratulate the society on its financial prosperity, as is shown by the balance sheet appended, while the subjoined list of communications made to the society during the past year will amply prove that the interest of the meetings has been well sustained.

Mr. Hardwich on the "Present State of our Knowledge of Photographic Collodion"—Mr. Wheeler on the "Solar Spectrum in its Relation to Photography"—Mr. Glaisher on "Pretsch's New Process"—Some "Remarks on Fluorescence" by Mr. Wheeler—"Remarks on Toning," by Mr. Heisch—Mr. Heath on the "Production of Direct Transparent Positives on Glass from Objects in Relief"—"Further Remarks on Toning," by Mr. Heish—Mr. Heath on "Manipulation in the Field"—"Remarks on Transparent Printing on Albumen," by Mr. Negretti.

Various interesting photographs have from time to time been exhibited, and special mention may be made of the transparent views of Windsor Castle and the other palaces, exhibited by Mr. Heath, and those from Java, Japan, &c., exhibited by Mr. Negretti. Two prints, the one by Mr. Heath, the other by Mr. Heisch, are also ready for presentation to the members for 1860. During the past year but little that is strictly new has been accomplished in photography; but, on the whole, the character of the pictures produced is more artistic than formerly. The experiments of Bunsen and Kirchhoff on spectrum analysis, though not made with relation to photography, may ultimately have an important bearing on the subject, specially with regard to the kind of artificial light best adapted for photographic purposes, by pointing to those substances whose flames appear in the most refrangible part of the spectrum. While speaking thus cheerfully of the past, the council regret that they cannot look forward with equal satisfaction to the future prospects of the society.

Circumstances have deprived the society of the assistance of some of its most effective members, several having left the neighbourhood, and others having been prevented by the pressure of professional engagements from taking any active part in its proceedings.

The number of working members being thus so greatly reduced, the council feel that they cannot carry on the affairs of the society in such a manner as to maintain the position it has so well won, even by taxing to the utmost the few who remain. Under these circumstances, they think it desirable to recommend the suspension of the periodical meetings, at least for the present.

They would hardly advise the entire breaking up of the society, as occasional meetings might be held when there is any subject of special interest to bring forward, and should any number of active photographers hereafter come into the neighbourhood, the periodical meetings could at any time be resumed without the formation of a new society.

In the mean time, the council would recommend that no subscriptions be for the present collected, and that the affairs of the society be entrusted to a committee who should be empowered to continue the subscription to the journal out of the balance in hand, and to call special meetings when considered desirable.

The Treasurer's account, showing a balance of £32 5s. 10d., was brought up and reported correct by the auditors.

Messrs. C. Heisch, G. Glaisher, H. T. Wood, and T. B. Wine, were appointed a committee to carry out the recommendations of the report, and the meeting adjourned.

South London Photographic Society.

The usual monthly meeting was held on Thursday evening, the 18th inst. F. F. Statham, B.A., F.G.S., in the chair.

Several specimens were contributed to the portfolio of the society, amongst which were an exquisite soft portrait of a sleeping child, by Mr. Fitch, landscapes by Mr. Howard, excellent specimens of the Fothergill process, a successful reproduction of one of Paton's paintings just sent in to the Royal Academy, by Messrs. Smyth and Blanchard, and some very delicate card portraits by Mr. Wall, the negatives produced by the intensifying process described in the beginning of the present volume of the Photographic News as successfully practised by Mr. Lacy.

The minutes of the previous meeting having been read, Messrs. Dennison and Chadwick were elected members of the society.

Mr. Hannaford then read the report of the Experimental Committee. (See pp. 182, and 197.)

Mr. G. Wharton Simpson handed round for inspection some very fine stereo negatives by the turpentine waxed-paper process, which had been forwarded to him by the Rev. J. Lawson Sisson, of Lausanne. He remarked, that as the question of dry processes was before the meeting, these specimens would be interesting as illustrating the amount of delicacy and perfect definition attainable in waxed paper. The exposure was only two minutes with a half-inch stop.

Mr. Sebastian Davis asked what was the focus of the lens with which the negatives were taken. It appeared to him probable that a double combination had been used; if so, the amount of definition and depth of focus the negatives showed appeared sufficiently perfect to admit of such lens being used with perfect success. He thought that in seeking a rapid dry process, the aid of the optician, in producing rapid lenses, was an element of importance to look to.

Mr. Simpson believed that a small portrait combination had been used.

Mr. Howard said he had no doubt whatever but portrait lenses had been used, but the definition was certainly exquisite. He had practised for a whole season with a pair of Jamin's combinations, but had found great difficulty in getting sufficient depth of focus; probably with some of the new lenses better results might be obtained, and rapidity at the same time. He was much interested in Mr. Hannaford's modification of the Fothergill process, and thought it likely to prove of great importance. For the purpose of a comparative estimate he had prepared four plates, one by the Fothergill process, as usually practised; then one fully washed before and after albumenizing; next one not washed at all, and finally one by Mr. Hannaford's modification. He exposed them all five minutes under similar conditions, the Fothergill plate was under-exposed, and so was the one fully washed. That by Mr. Hannaford's modification was fully exposed and a good picture, and the plate not washed was nearly a good one, but somewhat stained. He thought that the possession of the sensitive compound, ready mixed in due proportions, was a most important thing, on account of the immunity from stains. Altogether Mr. Hannaford's modification was a move in the right direction, both in simplifying manipulation and guaranteeing good results.

Mr. Borchert had once tried a similar method, but whilst he found that sensitiveness was increased, he found that keeping properties were destroyed. The preservative solution itself decomposed after keeping a few days, and the plates would not keep more than a week.

Mr. Hannaford remarked that if these plates would not keep, neither would the Fothergill plates, because the same conditions existed in each, the only difference that in the Fothergill process the compound formed was a little more uncertain. In his method the silver was not added in excess, but only in proper proportions. It was, in fact, Fothergill simplified in manipulation, and rendered more certain in result. Instead of forming a salt of silver on the plate, it was formed before pouring it on. All considerations as to the exact amount of washing were settled. It was only necessary to first thoroughly wash, pour on the solution, and then thoroughly wash again. However successfully the Fothergill process had been practised for stereo negatives, it was an undoubted fact, that for large plates, such as 12 in. by 10 in. that process, except in the hands of the most careful operators, did not give good results. The salt of silver found on adding the albumen solution was irregular from the different action between the solution and the silver at the first point of contact, and by the time it had covered the plate, stains and irregularities of deposit were the consequence.

Mr. Borchert said that when the solution was prepared as Mr. Hannaford had described, he quite agreed as to the evenness of result obtained, but he did not see in that case how the sensitiveness could be increased.

Mr. Hannaford said that an increase of sensitiveness was not claimed, but simplicity of preparation and evenness of result. There was the simplicity of the tannin process without the risks of that process. Various salts of silver might be formed in the albumen solution, but he had not mentioned them because he had not tried them. In reference to the Fothergill process he might remark that the pictures which had been presented to the poltfolio that evening would show how in the most careful hands stains would occur which rendered it necessary to black out the skies.

Mr. Howard suggested that the most common cause of stains was the commencement of decomposition, which was generally at the edges of the plates.

Mr. Sebastian Davis said the reference that Mr. Hannaford had made to the exhibited pictures printed from the Fothergill negatives, accompanied by the inference that the existence of the white skies has been caused from a necessity of concealing some unevenness of intensity in the plates, called for the acknowledgement that such had been the case. He had already referred in the report under consideration to the great difficulty of obtaining a film that would yield equal intensity upon development when prepared according to the ordinary Fothergill process. This difficulty arose from the all but impossibility of producing an even distribution of nitrate of silver over the whole of a large sized plate, by the dilution of the stronger solution. The simple fact of having to incline the plate so as to allow the albumen mixture to flow rapidly over its surface necessarily caused an accumulation of nitrate of silver towards one end of the plate. Under these circumstances an excess of the insoluble albumino-nitrate of silver compound becomes instantaneously fixed in the body of the collodion film, and this accumulation was incapable of being equalised by any amount of subsequent washing. He had therefore aimed at the avoidance of this impediment to success by introducing a preservative solution which permitted the free nitrate of silver to be washed away, without the reduction of sensibility to the material extent that would occur with ordinary dilute albumen, under like circumstances.

Mr. Hannaford observed that in Mr. Davis's process the danger of stains was obviated by entirely removing all free nitrate of silver at the outset, and plates so prepared would be as clean as could be desired. At first glance it might appear that the entire removal of the silver would render it difficult to get sufficient intensity, but the conditions necessary to produce vigour were restored by the action of glucose.

Mr. Hughes asked how long Mr. Davis's preparation (a bottle of which was on the table) would keep.

Mr. Davis said three or four weeks in the warmest weather. The ammonia preserved it.

Mr. Hughes remarked that he had anticipated that, and presumed that so long as it was alkaline it continued all right.

Mr. Davis: Yes.

Mr. Hughes said he had noticed that even when decomposition had commenced, by filtering and then adding ammonia, the solution might be restored and kept a long time. Refering to the tannin process, and its alleged weak point, the film leaving the glass, some diversity of opinion existed on the subject. He knew one gentleman who had been experimenting with it, who had tried no less than fourteen different kinds of collodion, and had not found one which readily left the glass. This gentleman, he might observe, used twenty grains of tannin to the ounce. Mr. Hardwich had stated that he never found the film give way. Major Russell, the inventor of the process, recommended that the plate should be the first coated with gelatine, but Mr. Hardwich had found that to be unnecessary. Mr. Sutton had experimented largely with this process, and he did not find this tendency of the film to give way.

Mr. Davis remarked that he believed that Major Russell was so convinced of the importance of gelatine that he intended to adhere to its use. The great objection to it and albumen was the tendency to throw the nitrate bath out of order. The use of albumen as a first coating for the glass he believed had first been recommended by Mr. Barnes.

Mr. Hughes said he believed the priority of suggestion belonged to the Rev. Mr. Laws.

Mr. Hannaford thought that the greatest objection to the use of any previous coating was that the great recommendation of the process, its simplicity, was destroyed.

Mr. G. Wharton Simpson remarked that so far as the nitrate bath was concerned, the albumen could be first coagulated by means of sulphate of iron and all injury to the nitrate bath thus prevented.

Mr. Hughes said the great merit of the tannin process was its simplicity and freedom from complication, and if the manipulations were multiplied its merits were largely destroyed. In its simplest form it was the nearest approach to the model dry process—a simply washed plate. The processes of Mr. Hannaford and Mr. Davis were in some respects similar, but the tannin solution itself was so easily prepared, that in that respect it took precedence of all preservative solutions. The rapidity with which it developed was also a great point, as it most nearly resembled wet collodion in that respect. It would be a great pity not to be able to use it without the bother of gelatine or albumen, which involved either the use of a separate bath, or previous coagulation of the film.

The Chairman suggested that a careful attention to the state of the glass when coated, to be sure that it was absolutely free from moisture, would be important.

Mr. Blanchard suggested that one cause of the tendency of the film to leave the plate was the different expansive powers of the tannin and collodion, when wetted.

Mr. Davis asked if any one had had any experience in the use of the resin process.

Mr. Clarke had tried the use of almost every resin and gum in the collodion. It was very rapid, but there was a great tendency to uneven development. Shellac he had found answered best. The details of his experiments were published in the Photographic News some time ago.

Mr. Hannaford had tried the use of gum elemi in the collodion, and thought the results so far promising. The chief faults he had found were stains arising apparently from the irregular draining of the plate. He asked if Mr. Clarke had tried a bath of salt water as a means of getting rid of the stains.

Mr. Clarke had done so, and the sensitiveness was so much lessened that he was unable to get a picture in as many minutes as it otherwise took seconds.

Mr. Wall announced that arrangements were in progress for a soirée at their annual meeting, and he would be happy to receive the names of gentlemen for the number of tickets they would require. His own paper "On Sharpness" would stand over until the next meeting, when also Mr. Sydney Smyth would read a paper "On the Solar Camera."

Mr. Thomas Clarke then read a jotting

ON THE STEREOTROPE.

Permit me to make a few remarks on the stereotrope exhibited at the soirée of the Photographic Society at King's College, on the 4th inst., and in which was shown some machinery in motion; on looking at which, I was immediately convinced of the impossibility of representing the steady progressive movements of machinery; for in this instrument, several pictures, taken at various stages of progression, are presented to the eye one after the other; whilst on the other hand, the image presented to the eye by the machinery itself, is, I may say, *one* ever changing picture, and not made up of distinct images; hence the jumping appearance which has already been described by Mr. Simpson, in the Photographic News; this I think can never be entirely overcome, it may be lessened to a considerable extent by multiplying the pictures, but not entirely overcome, from the beforementioned cause.

No doubt for some objects it will be very well adapted; objects in which distinct images are presented to the eye in succession, such as animals in motion, where one foot is placed before the other, and is actually at rest for a certain fraction of time, or the uplifting of a hammer, where two pictures would be found sufficient for the illusion, and a multitude of objects of this description may be very well exhibited.

There is also another point to which I would call attention, and that is, only half the picture was visible; possibly, however, this may be overcome by enlarging the aperture, as suggested by Mr. Shadbolt at the soirée. I do not wish by these remarks to at all depreciate the value of the discovery, or rather, the application of a known principle to stereography; on the contrary, I admit it to be very amusing and instructive, and it may be a useful addition to our inventions; but I do think it unadapted for representing such objects as machinery in motion. While upon this subject, I take opportunity of giving an idea of my own, with regard to stereoscopic views, viz., to obtain two panoramic pictures, at the proper angle for viewing them in the stereoscope, and mounting them on rollers, so that they may be viewed in the stereoscope as a moving panorama; I conceive the effect would be charming, and it might easily be accomplished by making a slide with four rollers, one on each side and two in the centre, these could be connected by a piece of silk, and made to turn by a handle at the the end similar to the frame used for the snow-storm in the magic lantern.

After the usual votes of thanks the meeting separated.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 24th April, 1861.

On the 1st of August next the Exhibition of the Association for the Encouragement of the Industrial Arts in Belgium will be opened at Brussels. A section will be appropriated to photography, including proofs of scientific, technic, and industrial objects; artistic proofs on silver, plate-glass, &c.; works of art, antiquities, landscapes, portraits, artistic studies, &c.; photographic engravings, and the various applications of heliography. Exhibitors are invited to give a summary account of the nature of the negative process employed, whether collodion, wet, dry, or preserved, albumen, paper waxed or plain; any other particulars which it may be useful to add separately, for the information of the jury, upon the particular process, negative or positive, will be received with interest. The photographs must be protected by frames, passe-partouts, or form an album; it will be necessary to state whether the proofs have been touched or not. Each exhibitor will be allowed to send a dozen ordinary portraits, and a dozen card-size portraits, and no more. Coloured portraits will not be admitted. A committee will decide upon the admissibility of the pictures; such as have been previously exhibited in Belgium will be rejected. Prizes will be awarded to the most meritorious works exhibited, the distribution of which will be made publicly; they will consist of medals; such works as merit the distinction will receive "honourable mention;" the Association reserves to itself the right of making acquisition of the works exhibited. Persons intending to exhibit must notify the secretary, M. Dulieu, at the Palais Ducal, Brussels, before the 1st of June, by letter, post-paid, giving particulars as to the nature of the objects to be sent, the space required, in length, breadth, or height. The objects sent for exhibition must arrive before the 5th of July; they must be accompanied by the name and address of the exhibitor, and a statement whether he be the producer or the exhibitor merely; in the latter case, the actual producer should be specified, if possible. A note must also be sent to the secretary of the terms in which the articles exhibited should be described in the catalogue, together with the price, if for sale. Exhibitors must bear the expense of transmitting the objects sent, and also of their return.

The leaves of Indian corn, or maize, are now employed to a considerable extent in the manufacture of paper of good quality, superior in some respects to that obtained from rags; means have been discovered whereby the silica and the gum-resinous matters may be separated from the leaves. Two paper mills for the manufacture of paper from this source are now in operation, one in Austria, the other in Switzerland. The leaves contain naturally so much gummy matter that the pulp does not require the addition of sizing to fit it for writing paper: this gummy matter can be removed from the pulp if desired. The pulp is very easily and quickly bleached, if necessary, but its colour is so slight, that for many purposes bleaching will be found unnecessary. Maize paper is very strong, more so than paper made from rags. The machinery required for converting rags into pulp is not required for maize leaves, hence arises a notable economy in the process of manufacture.

Sea-weed has been recently adopted as a non-conductor between walls and roofs, to prevent sudden changes of temperature in dwellings. This material presents many advantages; it is indestructible, if kept in the dark: it does not harbour insects, it is uninflammable, and even serves as a check to combustion: enclosed between thin partitions, it serves, also, to check the propagation of sound. It has been tried in several kinds of wooden structures, and is found to answer so admirably that competent authorities recommend its extended judicious application. As it is hygrometric from the presence of saline matters, these must be removed by simply washing the weed in fresh water.

It has been found that vinous intoxication is an antidote to the morbid effects of the bite of venomous reptiles. The servant of a physician in the island of Manilla was bitten in the arm by a venomous snake: cauterization of the wound by a live coal was tried, but the symptoms of poisoning continued to manifest themselves in an alarming degree. The doctor then administered a bottle of strong wine: intoxication immediately followed, and the symptoms abated, but returned again as the influence of the wine passed off. A second bottle of wine was then administered, with salutary effect; then a third was given. Ultimately the patient recovered, exempt from all symptoms of poisoning.

Mr. Beauchamp announces the discovery of a new property of platinum, that of reducing perchloride of iron.

ALKALINE GOLD TONING.

Sir,—For some time back I have been making experiments in relation to gold toning. After trying a variety of different baths, and each one having some objection, I set about a series of experiments in search of a bath that would act as desired. I at last succeeded, after many disappointments, in producing a bath such as has long been desired. I will not enlarge upon its peculiar merits, but leave it to those who may try it, to whom I would feel obliged if they would communicate to me on that subject; the following is the formulæ:—

Chloride of gold	3 grains.
Acetate of potash	2 drachms.
Bicarbonate of soda	6 grains.
Nitrate of potash	20 grains
Water	7 ounces.

The proofs are first washed in common water. Then in the following bath:—

Chloride of ammonia	1 drachm.
Water	20 ounces.

Wash in plain water, then tone, and keep the bath to 70° Fahr. In a few minutes it will be done, wash well in warm water, and fix in hypo 25 per cent. I expect soon to communicate a new dry process, the preservative used is coffee. W. B. Fawcett.

Carlow, April, 1861.

[We have already had the [tapioca, rice, eggs, raisins, honey, sugar, candy, raspberry syrup, jelly, ale, porter, stout, wine, gin-and-water, and tea processes. Now we are promised the coffee process, and we heard the other day from a clever photographer that the best waxed paper negatives he ever saw were "waxed" with *dripping!* We hope shortly to see a new edition of Dr. Kitchener's "Cook's Oracle" adapted to the use of photographers. We look with interest for the coffee process.—Ed.]

HORIZONTAL STOPS.

Sir,—Oblong square diaphragms, similar to those described by your correspondent, Mr. Maginn, in your last number, were made to my instructions by Mr. T. Ross, on the 14th ult.

It would thus appear that improvements in photographic instruments do frequently suggest themselves simultaneously to various persons.

In my practice, the result has been the attainment of a degree of definition, absence of distortion, and depth of focus in the picture which, with the same lenses, I have previously never been able to attain.

Ocular demonstration being, however, better in these matters than mere words, I enclose for your inspection two pictures, perfectly untouched, taken with these new diaphragms, and am, sir, your obedient servant,

Lake Price.

London, April 21, 1861.

[The two large pictures (11 in. by 9 in.) which Mr. Price has forwarded, possess most excellent modelling and relief. We should have felt disposed to attribute much of this to careful lighting and artistic skill; but the statement that the same lenses could not be made to give equal results before meets such a suggestion. Coming from such hands we need scarcely add that the photographs are full of picturesque beauty. Such pictures can assuredly find no place under the head "machinery" in the International Exhibition next year.—Ed.]

THE TANNIN PROCESS.

Sir,—I beg to send you the following particulars of a simple and very successful way of working this process.

Coat with a bromo-iodized collodion (Hughes', Greenish's, and Ponting's answer excellently).

Sensitize in ordinary negative bath.

Remove to upright bath of distilled water, till the next plate is ready to take its place.

Then wash in a dish of ordinary water for half a minute.

Pour over the plate a few drachms of distilled water.

Coat with—

Tannin	20 grains.
Citric acid	1 grain.
Distilled water	1 ounce.

Pour on a sufficient portion of this to cover the plate, let it run off into the sink; pour on fresh quantity, and let it remain on for twenty seconds, then drain, stand up to dry, and when surface dry apply artificial heat (a stone bottle full of hot water answers well).

Give long exposure, twice as long as a Fothergill or Taupenot plate requires. Before developing, wet quickly under a tap.

Apply the following developer:—

Pyrogallic acid	2 grains,
Glacial acetic acid	30 minims.
Citric acid	$\frac{3}{4}$ grain,

with one or two drops of a 10-grain solution of nitrate of silver. Fix with hyposulphite of soda.

With ordinary care there is no fear of losing the film. I have developed plates that had been scratched all across without difficulty.

It remains to be proved yet whether this process is worth all the stir that has been made about it. I believe it is the cleanness and brightness of the development which dazzle the eyes of many, so that they do not notice the absence of those qualities which render albumen processes so valuable.—Yours, &c. J. G. C.

Photographic Notes and Queries.

Dark Tents.

Sir,—You would confer a favour on many of your readers, who, like myself, reside in the country and, consequently, have not the opportunity of seeing any new invention, by giving us a description of the best dark tent for the wet process in outdoor photography; Leake's and Smart's are often recommended, but I have not been fortunate enough to see a description of either.—I am sir, yours, &c. J. L.

Blencogo, Cumberland.

[A description of Leake's tent has appeared in the Photographic News and also in the Photographic News Almanac We intend to describe Smart's and some others shortly.—Ed.]

Albuminate of Silver in the Fothergill Process.

Sir,—The modification of the Fothergill process, detailed by Mr. Hannaford, last week, is, in my opinion, the best. I have tried the identical plan he recommends (*vide* Photographic News, Feb. 1), and find it is more sensitive, and more easily prepared. I have sent a negative for your inspection, not as a specimen of the *best* results, but as an average one.—I am, sir, yours, &c. Wm. B. Bartholomew.

Fareham, April 24, 1861.

[Our correspondent's letter will be found on p. 53 of the present volume, with the initials W. B. B. It will be seen that the suggestion is identical with that just made by Mr. Hannaford. The negative forwarded is of a fine red vigorous character.—Ed.]

Gallo-Citrate of Iron Developer.

Sir,—I see in your very valuable paper some remarks on developing negatives, and, as the exact method I make use of has not been noticed, I will, if you think proper to insert it, lay it before you.

I make a developer of from twenty grains per oz. of water, and another of two grains pyrogallic acid per oz. of water. Of each of these take equal quantities, and mix, which produces a thick muddy solution. Now add a saturated solution of citric acid, until the liquid becomes a clear green colour: add a little alcohol, about a half-ounce per pint. On proceeding to develop, flow just sufficient distilled water over the plate to cover it for two or three seconds, then return this to the measure, and add to it sufficient developer (about one and a-half ounce to a plate nine inches by seven inches), and develop with this. If the negative should look likely to become too dense before the details are well out, pour this away, and use the strong developer as it is: a little practice will determine whether this is necessary or not. Should you think this of any interest, you may insert it.—Yours, &c.,

Blaenavon, April 23*rd.* J. Burgoyne.

[This formula is as nearly as possible the same as that of Mr. Tunny, which we published a few weeks ago. The details of manipulation here given are good, and may be followed with advantage.—Ed.

Talk in the Studio.

Photography and Art.—Mr. Samuel Fry has recently been engaged in taking a series of negatives, 25 inches by 18 inches, and 10 inches by 8 inches, of the interior of the Great Western Station, engines, carriages, &c., for Mr. Frith, as aids to the production of his great painting "Life at a Railway Station." Such is the value of the photograph in aiding the artist's work, that he wonders now however they did without them!

Stereo Exchange Club.—A correspondent writes on this subject:—Regarding the Stereo Exchange Club—suppose A. be dissatisfied with B.'s picture in return for his, let both be sent to you, and then say, "We consider Mr. B.'s stereograph 'Grazing Cattle' decidedly good (or bad, as the case may be), and a fair (or by no means a fair) exchange for Mr. A.'s 'Scene on the Wye.'"

A New Application of Photography.—A circumstance recently occurred showing the great business utility of the modern discoveries of Photography and the Electric Telegraph. The Count de Penafiel left Lisbon for Paris, carrying with him an order for 70,000 francs; this, however, he unfortunately lost on the road, and telegraphed the same to his banker at Lisbon; that gentleman at once telegraphed to Paris stopping payment of the order, but sent by post the portrait of the Count de Penafiel, stating that the amount might be paid to him when he presented himself.—*Times.*

Pistolgrams of Babies.—Mrs. Arabella Araminta Angelina Smith, writing in *Punch*, has been horrified by an advertisement which she says is headed, in big type "Pistolgrams of Babies." "Good gracious, *Mr. Punch*," she adds, "pray what *ever* is a pistolgram? Is it some new-fangled fire-arm, like an Armstrong breech propeller, and can it be intended really to go *off?* If so, I'm sure *infanticide* will be alarmingly increased, and it will be a mercy if but one out of a dozen of one's babies is not shot. I know I've thought a pop-gun a sadly dangerous thing, and as for those toy rifles one now sees in every nursery, I'm quite sure that it's not safe for chilbren to be left with them; for though Charles says they can't be loaded, they've got great bayonets stuck on to them, such as seem made expressly to poke one's baby's eyes out. But what destructive implement a 'pistolgram' may be, I confess I really have not courage to inquire; only I feel *convinced* that if it be *one-half as terrible as its name seems to imply*, our infant population will be dreadfully decreased. I know I'll take good care that nobody shall buy my *ittle tiddleums* a pistolgram, unless I see quite clearly that it can't do any harm; and for my part I can't think why people can't use common English when they want to name a thing, instead of puzzling one with gibberish that no one understands. Yours abruptly, *Mr. Punch*, for *ittle tittleums is crying*." Arabella Araminta Angelina should visit Mr. Skaife's establishment, and she would find that, notwithstanding the startling name, some of the "pistolgrams" of babies are amongst the exquisite specimens of portraiture which the art has produced.

Fine Arts Copyright.—The Attorney-General's Bill gives to the author for his life, and thirty years after his death, a copyright in pictures, and works of sculpture, and drawings made, or for the first time disposed-of after the passing of this Bill; and this right is to extend to a copy of any work of fine art (lawfully made). The same copyright is also given to the authors of architectural works, (plans, models, etc.,) but when a building has been constructed no person is to be precluded by this Bill from making plans or models from the building itself, and constructing any building therefrom. The Bill includes works of fine art published abroad, and gives copyright in them; but no copyright will be acquired in any case unless the name or monogram of the author is legibly placed upon some conspicuous part of the work. Penalties imposed for all fraudulent productions, falsely pretending to be the work of an artist who is not the real author, or colourable imitations to be passed off as executed by him (whether there be subsisting copyright or not), and, though there may be no subsisting copyright in a work of fine art, no person (except the last proprietor of an expired copyright in it) may use the name of the author upon any engraving during his his life. The importation of piracy is actually prohibited.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

To Correspondents.

B. L.—We prefer freshly-made starch for mounting prints. If you can get them rolled or hot-pressed, or passed under the pressure of a lithographic or copper-plate press, so much the better.

Meta.—A view lens can rarely be used with anything like full aperture. For a lens of six inches focus, use a three-eighths stop.

A. B. S.—The best, indeed in many cases the only available method of printing life-size pictures by means of enlarging camera, is by the development process, details of which were given in our last in the "Dictionary of Photography." The sketch of the megascopic camera to which you refer was not enclosed.

C. D.—Call on Mr. A. H. Wall, 28, Old Bond Street, and state your case. He is the best teacher of colouring whom we know, and will probably be able to meet your wishes as to terms. Probably joining one of his classes would suit your purpose.

T. T. L. K.—The formulæ of the "Alabastrine Redeveloping Solution" and the "Alabastrine Varnish" are trade secrets. Various recipes for preparations intended to serve the same purpose have appeared from time to time in our pages.

Wm. Deane.—The spots appear to proceed from some salt in or on the film of the negative, which has probably not been well washed after fixing, and appears not to have been varnished.

J. C. B.—To get rid of streaks the acid must be added to the bath. Add three ounces of distilled water to one ounce of nitric acid. One drop of this will be equivalent to a quarter of a drop of nitric acid. You will find details of the method of printing-in clouds to a landscape photograph in Mr. Fry's paper, p. 350, vol. iv. of the Photographic News. We did not receive your card.

J. L.—The size of the condenser has nothing to do with the amount of enlargement; it merely governs the amount of light and consequently the time of exposure. The solar camera has a condenser of nine inches diameter and about seventeen or eighteen inches focus. We have heard of one with a condenser of twenty inches in diameter: it is quite possible to get any amount of enlargement with a very small condenser, or with none at all.

J. Sands.—We do not immerse the prints in ammonia and water in our own printing operations. It is not necessary to tone immediately if inconvenient, in an hour or two will do, but the prints should during that time be placed in successive changes of water.

B. C. W.—An abstract of Mr. Mudd's method of working the collodio-albumen process is given in the Photographic News Almanac. We shall publish shortly a fully detailed statement of his manipulations, results of his experience to the present time. See Report of the Experimental Committee of the South London Society, in our last and present numbers.

X. L.—We believe that it is decided that about 90 degrees are all should be included in a picture by the panoramic lens.

L. A. D.—Over exposure was probably the cause of the effect you describe in your negative. The best method of increasing the strength of a nitrate bath, is to fill it up from a stock solution of greater strength than the original bath.

H. Bellini.—We have referred to your letter in our first article.

J. B.—One thickness of black, and another or two of yellow calico, make a very suitable covering for a tent; with sufficient of yellow only, to make a window.

A Lady Photographer.—It is difficult to state the cause of the spots on your charming little picture. You appear to have tried the majority of remedies which meet such a case. Have you been sufficiently careful to have no dust in the camera, or elsewhere? Are the negatives intensified by any process? Can sulphur vapours, or sulphur in any form, come near your negatives? The spots are similar in appearance to those we have seen on Daguerreotypes and glass positives, produced by sulphur.

W. D.—We have posted the letter.

E. Smith, Bath.—We have received the two pretty card portraits you forward, and shall be glad to know the intensifying process by which they were produced. Your lens scarcely covers sufficient space, with a flat field, for standing figures, but in other respects the pictures are very good.

Carl Holt.—The firm you refer to is certainly in existence. The transaction to which you refer certainly appears unbusiness-like, and can only be excused by some such unaccountable combination of circumstances as the miscarriage of letters, &c. It is not a matter which we can refer to more definitely in these columns. We have had good paper from several firms, amongst which we may mention Rouch, Hughes, Hope, Sandford, Stereoscopic Company, and others.

J. H.—The use of an alkaline gold solution will afford no certainty of permanency unless the prints are perfectly fixed. We have seen several prints toned by the alkaline process, which were faded in greater or less degree simply from imperfect fixation. Perfect fixing in fresh hypo is quite as important as thorough washing.

L. M. N.—Negatives intensified by means of bichloride of mercury always require varnishing, as the contact with the mercurial salt would injure the sensitive paper.

A. C.—It is quite a matter of taste. We do not like a crowd of accessories in the background, in any kind of photograph, carte de visite or otherwise.

T. H. N.—The drab or India paper tint round photographs is printed by means of lithography on the mount. Cards so printed ready for use are to be had of some of the dealers.

Clenow.—The corners of the carriers in the dark slide are best made of silver wire, other metals soon corrode and become destroyed.

P, P.—It is impossible to say which is the best tone for a photograph, as tastes vary. There is, moreover, a sentiment in colour which may be made materially to enhance the suggestive character of the monochrome of the photograph. A warm light tone most readily suggests the fair blonde, whose complexion would be quite ignored by a dark black-toned impression. Whilst a picture of the latter character would exactly indicate the dark eyes and raven tresses of the brunette. So also in landscape the mellow effect of a sunset landscape would be suggested by a glowing warm-toned picture; whilst the leafless trees, and snow-covered ground in a winter scene, may, with propriety, receive a colder greyer tone. Use judgment in these matters.

F. Y. L.—Flatted crown glass may be used with advantage for positives; but for negatives it is safer to use patent plate, because of the chance of breaking in the pressure frame. If you use flatted crown for negatives, try each glass in the pressure frame before taking a picture on it.

A Photographic Tour in Wales will be continued next week

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 139.—*May* 3, 1861.

COPYRIGHT IN WORKS OF FINE ART.

We congratulate our readers on the probability that before the present session of parliament shall be brought to a close, the productions of our common art will, for the first time, we believe, receive legislative recognition as works of fine art.

We have already notified our readers that a Bill was recently introduced into the House of Commons by the Attorney-General, entitled "A Bill for amending the law relating to Copyright in Works of the Fine Arts, and for repressing the commission of fraud in the production and sale of such works." From the section devoted to the interpretation or construction of terms we find that the word "picture" shall include "every drawing, painting, PHOTOGRAPH, or other work (except engraving as hereinafter explained) which on a flat surface embodies any design, or represents any scene or object, by means of any process or material." From another clause of the same section we find that the word "engraving" shall be understood to mean "the embodiment of any design, or the representation of any work of fine art by any means or process upon metal, stone, wood, glass, or any other material whereby copies may be multiplied on flat surfaces." And finally a further clause declares that the term "work of fine art" shall include "every picture, work of sculpture, engraving, and architectural work."

The terms here employed, it will be seen, are most comprehensive, and in a variety of ways include photographs by every possible process within the provisions which follow. These provisions, are, we think, of a most satisfactory nature, and give the most complete and lasting protection to property in ideas and works of skill.

First, then, as to works embodying original ideas; the provisions of the Bill are as follows:—

"The author of every picture, work of sculpture, and engraving, which shall be made, or for the first time sold or disposed of, after the *commencement of this Act*, and his assigns, shall have the sole and exclusive right of copying, reproducing, and multiplying such work, and the designs thereof, by any means, of any size, and for any purpose, for the term of the natural life of such author, and *thirty* years after his death."

The intention of the Bill as regards Reproductions is stated as follows:—

"Every person who, after the *commencement of this Act*, shall lawfully make or cause to be made any picture, work of sculpture, or engraving, from or after any work of fine art, and his assigns, shall have the sole and exclusive right of copying, reproducing, and multiplying such picture, work of sculpture, or engraving, by any means, of any size, and for any purpose, during the term of his natural life, and *thirty* years after his death."

In order to bring any picture under the protection of the intended law a very simple expedient is necessary, and since this is very important, we call special attention to it. It is thus stated:—

"No copyright shall be acquired in any work of fine art, or in the design thereof, until the name or monogram of the author or maker thereof shall be legibly signed, painted, engraved, printed, stamped, or otherwise marked upon the face, or some other conspicuous part of such work."

The fourth section defines the extent and limits of the intended law as regards reproductions:—

"Nothing herein contained shall prejudice the right of any person to copy or use any work of fine art in which there shall be no copyright, or to represent any scene or object, notwithstanding that there may be copyright in a copy or imitation previously made of such work, or in some representation of such scene or object, as fully and amply as if this Act had not passed."

Other sections have reference to matters of detail, such as the mode of transfer of property in copyrights, the extent of retrospective action intended, &c.; but some of the most important clauses are devoted to the penalties incurred by an infringement of the copyright to be conferred by the Act. It is here provided that

"If the author of any work of fine art in which there shall be subsisting copyright, after having sold or disposed of such copyright, or if any other person not being the proprietor for the time being of copyright in any work of fine art, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, hire, or distribution, or cause, or procure to be repeated, copied, colourably imitated, or otherwise multiplied for sale, hire, or distribution, any such work, or the design thereof, or any part of such work or design, or after having received, either verbally, or in writing, or otherwise, from any source other than the proprietor of such copyright, knowledge that any such repetition, copy, or other imitation of such work or design, or any part thereof respectively, has been unlawfully made, or after having been served with, or had left at his premises, a written notice signed by such proprietor or his agent to the same effect, or by any or other means knowing or having reasonable or probable cause to believe that any such repetition, copy, or other imitation has been unlawfully made, shall import into any part of the British dominions, or sell, publish, or let to hire, distribute, or offer for sale, hire, or distribution, or cause, or procure to be imported, sold, published, let to hire, distributed, or offered for sale, hire, or distribution, or shall have in his possession for any or either of these purposes, any repetition, copy, or imitation of the said work, or of the design thereof, or of any part thereof, made without such consent as aforesaid, such person for every such offence shall forfeit to the proprietor of the copyright for the time being a sum not exceeding *one hundred pounds*; and all such repetitions, copies, and imitations made without such consent as aforesaid, and all plates, blocks, moulds, dies, negatives, and other things which shall be exclusively applicable for obtaining such copies, shall be forfeited to and be the property of the proprietor of the copyright."

In the following section it is provided that the imitation or forgery of the name, initials, or monogram of any artist upon a picture, with intent to defraud, shall be regarded as a misdemeanor, and punishable with imprisonment for two years, with or without hard labour. The penalties incurred for the infringement of copyright under these provisions are recoverable either by action or by summary proceeding before two or more Justices of the Peace having jurisdiction where the offender resides. It is provided, however, that no action or proceeding of any kind shall be commenced without notice in writing to the offender of at least one calender month; and within three months of the commission of the offence constituting the ground of proceeding.

From the extracts and the rough outline of the Bill we have given, it will be seen that the amplest protection is intended to be given to every form of property produced by the inventive brain, or skilful hand of the artist, whether he be sculptor, painter, photographer, or engraver. The Bill appears, in all respects, so far as we can judge, an admirable one. We must not, however, be too hasty with our pæans. It is, at present, only a Bill, not an Act: a "project of law," not an accomplished fact; and a score of proverbs rush on our memory to warn us of the slips that may yet occur. The end of the session is not yet; and the "slaughter of the innocents," so fatal to embryo laws, is not yet over. Of one of

Serjeant Talfourd's Bills, it is recorded that the House divided upon it twelve times in one day, and finally threw it out. The Bill has, however, by this time, been read a second time, and we hope shortly to be able to record that it has passed into law.

In this document, at least, the productions of the photographer are recognised as "works of fine art," notwithstanding the classification of Her Majesty's Commissioners for the International Exhibition of 1862. We shall have something to say on this subject shortly. We have abstained hitherto for reasons we shall explain.

PHOTOGRAPHIC EXHIBITION AT BIRMINGHAM.

WE beg to call the attention of our readers to an announcement in our advertisement columns, of the Exhibition in connection with the Birmingham Photographic Society, to be held at Aston Hall, commencing towards the close of the month. The town of Birmingham is largely identified in many respects with photography, and its Society numbers some of the best photographers in the kingdom. The medals to be awarded, of which there are six, embrace a new feature, we observe, two of them being devoted to the productions of the solar camera. It is somewhat unfortunate that the notice should be so short, we apprehend it arises from causes beyond control. We trust, however, that intending exhibitors will bear in mind the Spartan's motto —"If your sword be short, add a step to it."—and make up in exertion what is lacking in time. We hope the Exhibition will be in all respects a successful one.

The following are the published regulations:—

The Exhibition of the Society will be opened on Monday, May [illegible], 1861, and will continue open three or four months.

All descriptions of photographs will be admissible together with apparatus, &c., used in producing the same, or in any way connected with the art, as also photographic engravings, &c.

It is recommended that all pictures should be framed and glazed, and the margin of the mounting-board should not exceed three inches in width; but unframed prints will be allowed.

In the case of pictures of smaller size than 9 by 7 it is desirable that four or more should be placed in one frame; but no frame must exceed twelve square feet in area.

Each picture, or frame of pictures, must have the name and address of the artist and exhibitor distinctly written upon the back, together with number, which number must correspond with a list of the subjects to be inclosed with them, specifying the particular process, whether calotype, waxed-paper, or the different varieties of collodion by which the negatives were taken from which the pictures were produced, and, if for sale, the price.

Touched or coloured prints must be accompanied by an untouched copy.

The Society will award three silver and three bronze medals for the best pictures in the Exhibition. One silver for the best portrait or group; one bronze for the *second* best. One silver medal for the best photograph of any other subject, landscape, composition, or otherwise; one bronze medal for the *second* best. And one silver medal for the best photograph from the solar camera. The whole of the above to be pure [illegible] photographs. A bronze medal will also be awarded to the best coloured photograph from the solar camera.

The solar pictures to be of not less size than 21 by 17, and unless taken in Great Britain will be disqualified from competing for the prizes.

All works intended for exhibition must be delivered at Aston Hall, near Birmingham, not later than the [illegible]th day of May next.

Any picture received after the [illegible]th day of May will be ineligible for competition for the medals.

A commission of 1[illegible] per cent. will be charged on all sales made during the Exhibition.

A list of the photographs sent must be inclosed with them, and a duplicate forwarded to the Hon. Sec., together with such other particulars of process as the exhibitor may wish to communicate.

At the close of the Exhibition the pictures remaining unsold, or not for sale, will be carefully packed and returned to the owners.

Scientific Gossip.

ALTHOUGH cyanide of potassium is confessedly one of the most poisonous chemicals with which the photographer can deal, cases of fatal poisoning produced by its means are fortunately very rare,—so much so, in fact, as to lead some persons to doubt that it is an active poison at all. A case of poisoning has, however, recently occurred in a photographer's family, which presents several points worthy of notice; and the extremely rapid action of the poison cannot fail to serve as a warning to all who are in the habit of handling and leaving about this salt. The unfortunate victim in this case was a servant in a photographer's household, and the following notice, which is condensed from the official report of the case, will explain the circumstances which led to the fatal result. The deceased was 17 years of age. The evening before her death she had appeared slightly indisposed, and went to bed without taking any supper. In the morning she came down apparently well, and had breakfast, but refused to take any dinner. Up to four o'clock in the afternoon she did her household work as usual, when she was sent by her mistress into the portrait-room (immediately adjoining the dark room in which the chemicals were kept) to light the fire. She returned in a few minutes, and busied herself in getting the tea ready. Her mistress's attention was now attracted by her extraordinary attitude. She stood with a fixed stare, face twitching, and her hands hanging down from the wrists, as if paralysed. Her mistress ran to her, caught her in her arms in the act of falling, and put her in an arm-chair. Now followed a severe attack of general convulsions, with froth from the mouth and nose, supposed by witnesses to be an epileptic seizure. Some brandy was then administered, of which she swallowed a little with difficulty, and appeared for some time to be rallying. The convulsions, however, returned. She suddenly stiffened her legs, gave a few gasps at long intervals, and died. The attack seems to have lasted about twenty minutes, during all which time she neither spoke nor screamed. It appears, also, that the period from the time of her taking the poison—*i. e.* when she was sent into the portrait-room—till she was first seized, could not have exceeded ten minutes; so that the whole period, from taking the poison till death ensued, was between twenty-five and thirty minutes. Some additional evidence was elicited at the inquest, viz., that she had had a quarrel with her lover the evening before, and that one of the lumps of cyanide in her master's stock bottle was observed to have had a portion recently broken off. The deceased was first seen by a medical man when she had been dead about half an hour. A *post-mortem* examination was made forty-one hours after death; and fifty-two hours after death a chemical examination of the contents of the stomach was made by Mr. E. R. Southby. The contents of the stomach, amounting to about four ounces, consisted of a grayish viscid fluid. The reaction was slightly alkaline. About two ounces were acidulated with sulphuric acid, and distilled in a glass retort till about half had passed over. During the distillation, the smell of prussic acid was perceptible, but a good deal masked by the stench. About one drachm of the distillate was boiled with a little sulphide of ammonium, till the smell of the latter had disappeared. On the addition of a few drops of sesquichloride of iron, the deep red colour of the sesquisulphocyanide of iron appeared, this colour disappearing completely on addition of a solution of bichloride of mercury. Another drachm of the distillate was rendered slightly alkaline by solution of potassa, a small crystal of protosulphate of iron added, and the whole boiled: a drop of sesquichloride of iron solution was then added, and the mixture acidulated with hydrochloric acid. A blue colour was produced, disappearing on addition of solution of potassa in excess, and reappearing on acidulating with hydrochloric acid. On standing for twelve hours, the Prussian blue was deposited. The residue left in the retort was evaporated to dryness, ignited till a greater portion of the carbon was driven off, and digested with hot distilled water and the solution filtered. On addition of hydrochloric acid, alcohol and bichloride of platinum, a yellow crystalline precipitate was formed, which was seen under the microscope to consist of octohedra of the double chloride of platinum and potassium. The above leaves no doubt that the poison taken was cyanide of potassium. We hope this will act as a warning to careless photographers. Such a poison as this should never be left where it could fall into the hands of ignorant persons, or those with criminal intentions. Many instances are on record of the terribly fatal action of this poison:

prussic acid, in fact, is as poisonous when combined with potash as when in the free state. Thus, two grains and a half of the pure salt are equivalent to one grain of anhydrous acid, or fifty minims of the acid of the London Pharmacopœa. Cyanide of potassium may therefore be regarded as a solid, containing prussic acid in its most concentrated form, no less than 39·3 per cent. by weight. A dose of three to five grains of the pure salt may, therefore, easily destroy life; and, in fact, less than five grains of the commercial cyanide, which is known to be very impure, has been known to be fatal, death having taken place in a quarter of an hour. In case of this poison being taken by accident, by any of our readers, solution of protosulphate of iron (positive developing solution) should be instantly swallowed in large quantity. No time whatever should be lost in taking this antidote, as the symptoms of poisoning occur with such rapidity and violence that there is scarcely time to employ treatment. The sulphate of iron is the best antidote known; and this, taken instantly, would have the effect of decomposing the poison, and converting it into Prussian blue; but if many minutes be allowed to intervene, the blood becomes poisoned, and then no chemical antidote can reach it. The best treatment, next to administering sulphate of iron, is to give an emetic, and to pour cold water on the head and along the spine, from a considerable height. The vapour of ammonia may likewise be applied to the nostrils; but, unless the patient be treated very early, there is little chance of recovery from a large dose.

The subject of the temperature of the toning bath has been more than once mentioned as being of importance to the proper colouring and fixing of the prints, but we are not aware that any accurate experiments have ever been undertaken on this point. Talking, a few days ago, with one of the best photographic printers we know, he stated that he considered the secret of his invariable success was in always regulating the temperature of his toning bath to a certain degree. He uses a bath consisting of one pint of water, six ounces of hyposulphite of soda, and three grains of the double chloride of gold and sodium. This is to be kept at a temperature of from 120 to 150 degrees Fahrenheit and the pictures immersed in it. In less than ten minutes the prints are perfectly fixed and toned to a rich, velvety black colour, with brilliantly clean whites free from any yellow, cheese-like appearance. The bath is kept hot by a very simple contrivance; a tin vessel is made sufficiently large to allow the porcelain toning dish to fit tightly into the upper part, leaving about two inches space between the bottoms of each. Two circular apertures are made in corners of the tin vessel, one to allow of fresh water being poured in to replace that lost by evaporation, and also to allow of the escape of steam, and the other to admit of the introduction of a thermometer. Hot water is poured into the tin vessel to within half an inch of the bottom of the porcelain dish, and is kept at the proper temperature by being placed on two large, flat, oblong iron weights, previously made hot in the fire.

Notes and Jottings.

No. 6.

Modification of the Fothergill Process.

When communicating to the Experimental Committee of the South London Photographic Society the result of some researches made in dry plate photography, we were not aware that a modification of the Fothergill process, which we then suggested, had previously been proposed, in these columns, by Mr. Bartholomew. So far as concerns ourself the idea was solely arrived at by considering what took place during the preparation of a Fothergill plate.

We have now made further experiment in the same direction, so as to be able to place before our readers more definite particulars of manipulation. General instructions serve very well for the more experienced photographer; but there are many amateurs who prefer having clear and full information on minor details. We therefore add the following "jottings" to our former communication.

It is very desirable that the preservative solution should contain a defined amount of silver, and, therefore, as ammonia is of very different degrees of strength, we have found it preferable to take nitrate of silver in certain proportion, instead of adding it so long as the precipitate would dissolve, as we formerly proposed.

The method of preparing the albumen solution we now prefer, is as follows:—

To the white of one egg add three ounces of water and about ten or fifteen drops of ammonia. Beat this in the usual manner until perfect limpidity is obtained, and then add a drachm of a thirty grain nitrate of silver solution (a portion of the bath will serve). A milky precipitate will be formed, which should be re-dissolved by the addition of ammonia, a few drops at a time, in just sufficient quantity to render the liquid clear, or, preferably, slightly milky. We have some solution a fortnight old, prepared thus, as good as when first made.

Any "dry" collodion may be used. After removal from the bath, thoroughly wash under the tap, or in a large quantity of water,—this cannot be too effectually done,—and then drain perfectly. We may here mention that the plate should be *completely* drained; for if any quantity of water remains, the albumen solution will not readily mix with it, and thus markings from uneven action are likely to arise. If the albumen contains a large excess of ammonia, this danger of stains is got rid of, as the solution in such case readily mixes with water; but the reason why we do not prefer ammonia in excess will be given presently. The plate thoroughly drained should be coated with albumen, which should be poured off and on two or three times, and then allowed to remain for a few minutes whilst the preparation of another plate is gone on with. Lastly, it is to be thoroughly washed, drained, and spontaneously dried.

As the albumen solution undergoes no alteration, excepting that of getting slightly diluted; it may be used over and over a great number of times. An ounce will be sufficient for a dozen stereoscopic plates.

Excess of free ammonia in the preservative solution has a tendency to dissolve out certain organic silver salts, which are formed in the film when old collodion is employed. This loss weakens the intensity, and unless the action be equal at all points, uneven development will result. We therefore find it advisable not to have ammonia in excess in the albumen. Michael Hannaford.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Chef d'Œuvre.—A French term, used to indicate a work of art possessing the highest excellence, as such; and sometimes to express the most excellent production of all an artist's works. We may thus speak of a picture as a *chef d'œuvre* of painting; or a statue, as a *chef d'œuvre* of sculpture; and of any single production as any particular artist's *chef d'œuvre.* Thus I regard the print by Mr. Mudd, which, as a member of the South London Photographic Society, I have just received, not only as a *chef d'œuvre* of Photography, but as Mr. Mudd's, also. (Beg pardon: the secretary will peep out sometimes, you know.) The Italian *Capo d'opere* is sometimes used to express the same meaning.

Chiaroscuro.—An Italian term, used to define the judicious arrangement or management of a picture's "*lights* and *darks.*" I use the words "*lights* and *darks*" advisedly, although the distinction between these and "light and shade" may appear but trivial. In connection with chiaroscuro, the photographer should learn to consider as "light," not only light proper, but the whole scale of tones which are not allied to darkness. For instance, he must regard a pale surface as light, even if it be really in shade; and an illuminated surface as *dark*, if it be really so in tone or colour (see *Breadth*). Hence it follows that, when considering this subject in connection with our selected picture, we should first examine it on the ground-glass, calculating the tones as light or dark in accordance, not only with their real appearance, but also with reference to colour in its relation to actinic influence.* By so doing, we acquire a nearly instinctive appreciation of the real value and importance of *chiaroscuro*, and discover, almost at a glance, the pictorial qualities of our subject. The operator, however, will never produce fine examples of effective *chiaroscuro* without understanding thoroughly the photogenic influence of the various colours in nature. It has been recommended to study this subject, by photographing the colours of mere pigments, and arranging a scale of the effects thus obtained; but although for the purpose of copying tinted drawings or paintings such a scale might be exceedingly useful, it would be of little real service in photographing from nature, when not only are colours subject to the varying influences of the quality of light, the character of surface, and the nature of the reflexions,† but the different actinic powers are frequently of a seemingly contradictory character. As a general rule. we may *approximate* to the desired effect by considering that red, orange, and yellow, either when pure, or forming the predominating elements of any other colours, tend more or less to produce "*darks;*" while colours belonging to the more chemically active portion of the spectrum tend, in similar degrees, to produce "*lights:*" but the true artist, aware of the extreme value of his picture's tones, in reference to *chiaroscuro*, will not be satisfied with information of so comparatively vague a character.

Chiaroscuro is one of the most important things in the expression of sentiment. In some pictures, the slightest touch of pure white would destroy all their feeling and sentiment; and others owe their wonderful effect purely to the entire absence of all the darker tones. Photographers seldom recognize this important fact, although they have sufficient command over their materials fully to secure these artistic and poetical effects. One operator's pictures may possess a well-arranged scale of tones between white and black; and another, we will say, possesses a different but equally beautiful scale, ranging between white and a tone short of black; while a third may ignore white, and revel the Rembrantesque effects of broad deep darks and shadows with subdued lights of a faint pale grey. But the mischief of it is, that each operator produces *one only* of these styles, and that without any reference to the nature of the subject, or the sentiment or poetry which should be embodied therein. The wildest scene from the most gloomy, rugged, and solitary of spots, or a group full of mournful and sombre interest, receive from the hands of such photographers just the same treatment as a bright piece of sunny landscape in a richly cultivated country; or a gay smile-moving episode of merry children's cheerful spring. Not only is this peculiar to mechanical manipulators in photography, but we see the same results produced by those of their number whose artistic capabilities and acquirements would lead you to hope for better things. Why is this? simply because photography is not yet regarded as one of the fine arts, because the scientific elements of the discovery have so thoroughly absorbed all the intellectual and mechanical efforts of its votaries that the pictorial has been thoroughly and completely neglected. Until the publication of the articles on "Chiaroscuro and Composition" by Lake Price in these pages, I do not think the slightest attention had been directed by any of the photographic journalists towards the practical application of the rules of art to photography.

Light and shadow well managed not only express infinitely more than is imagined by many, but will very pointedly suggest colour itself. A recent writer on art, speaking of photographs, pointed out how "even in the most perfect of these philosophical productions, a certain amount of pictorial effect is wanting, and a deficiencey is felt of that concentration of interest caused by a more artistic application of the rules of chiaroscuro."* How common it is to see photographs made up of a mass of monotonous tones scarcely varying in intensity throughout; having neither contrast, variety, nor effect; flat, poor, and weak; but still showing that a simple movement of the camera to the right or left would have brought in just enough of the lighter or darker tones to have produced a very brilliant and striking effect; and so converted an uninteresting patch of flat and sombre-hued paper into a picture of objects in relief surrounded by space, and full of pictorial interest. The most important elements of chiaroscuro will be found in the realization of the effects given by the atmosphere and by reflected lights, and in securing a focus of light to attract the eye, and a focus of dark which may give it increased brilliancy, all such considerations being, however, subservient to, or rather embodied in the idea of "*breadth.*"

H. Ottley, in his "Points of Criticism"† says "The observer of nature, whoever, in short, has paid attention to the different aspects of the same landscape when contemplated at different seasons of the year, or at different hours of the day—in bright and cloudy, or in damp and moist weather respectively,—need hardly be told how much the effect of a picture depends upon the quality, character, and direction of the light which is supposed to pervade it."

* See some articles on "Colour, in its Relation to Photography," in the 4th Volume of this Journal, especially that in the 93rd No.

†A colour—say in drapery—which is extremely non-actinic in its character, may be improved for your purpose by reflecting upon it a strong light of some colour which is chemically active, or, on the contrary, a too actinic colour may receive reflected light of a reverse character.

* George Barnard.

† In the "*Art Treasurer's Examiner*" (Smith and Son, Strand.)

ON PRINTING TRANSPARENCIES.

BY SAMUEL FRY.

It is scarcely possible that there can be one of my readers who has not been struck with the vast difference between the two methods employed at present for producing positive proofs from the stereoscopic negative. Great as always must be the pleasure of inspecting a really good proof, when printed of a rich warm colour, and on highly albumenized paper, the result is not to be compared with what might be produced from the same negative when printed by superposition on a prepared glass plate. I would not pretend to assert that the means of doing this involves no more trouble and care than printing on paper; but it is contrary to all experience to find that in any of the affairs of life the best results are obtainable without giving the utmost attention.

In my own hands, the simple processes I am about to describe have been productive of the most pleasing pictures, many of them from negatives which, when printed on paper, were very unsatisfactory. These processes have not been communicated to more than a few persons, each of whom have succeeded perfectly in producing proofs from their own plates, in many instances rivalling the finest productions of French photographers; and I feel, therefore, no hesitation in strongly advising my readers who have time, and who really wish to obtain the best proofs their negatives are capable of giving, to at once adopt it. It is no small recommendation to transparent printing to say that negatives, far too weak and transparent to print on paper, will, on glass, give positives of very great vigour: those who have seen the writer's published transparent stereograph of the sea, No. 3, entitled "A Sou'-wester," may judge by that of its capabilities. At the time the picture was taken, a heavy gale was blowing up from S.W., during the March equinoctials, and the sea was running higher than is often seen at Brighton, the sun being obscured by heavy vapours. After repeated trials, under the most disadvantageous circumstances, I succeeded in producing the negative from which the prints in question were obtained; and though, amongst the large number printed for sale, I am well aware there are some few copies which, from their want of vigour, should not have been issued, yet by far the large majority possess much greater density than the original negative; and several photographers capable of judging, who have seen the plate, strongly doubted, previous to printing, its power to produce strong proofs.

Although these processes may seem to involve much detail, and may, on perusing, seem complicated, yet it will be found, in practice, to occupy less time than the description requires. The following are the divisions into which I propose to separate the whole—Preparing the plates, Drying, Exposing, Developing, and Mounting.

I shall describe in detail, even at the risk of being rather tedious, the three methods I practise, giving with each the peculiarities of the pictures produced thereby. As will be remarked, the increase in the apparatus and chemicals of the photographer required for glass printing is so slight as to be within the means of all.

The three substances I have in turn adopted, to form the preservative coating over the plate, are all well known to the readers of the Photographic News. They are albumen, gelatine and oxymel; and as each produces a picture, having its own characteristics, I will explain, for the benefit of intending experimenters, what my experience of the result of each is, as a guide to its adoption or rejection. I first commenced with oxymel, using 1 dram thereof to 4 oz. of distilled water, applied in the manner hereafter described. When dried quickly before the fire, or in a tin box, with external heat, these plates become quite dry, smooth and comparatively hard. The picture developes up very rapidly, and acquires a rich, almost blue tone, with great vigour and transparency. This is peculiarly suited to weak negatives. The only fault of the process is that, from the hygrometric properties of the infinitesimal quantity of oxymel (honey, water and acetic acid), the plates are liable, if kept long, to become rather soft in damp weather, and thus, during the close contact of printing, small particles, like pin points, are taken off, leaving transparent holes. The remedy is, to keep them in a tolerably warm room after preparation.

The second plan is by gelatine. Plates thus prepared require careful wetting after exposure, as gelatine being slowly soluble, the developer would otherwise be tardy and unequal in its operations. Gelatine is easily applied, develops cleanly and slow, and acquires ultimately a good, rich, sepia tone, dependent to some considerable extent on the quantity and character of acid present during development.

The third plan is albumen, and is, in fact, equivalent to the collodio-albumen plates in their first state, using plain; instead of iodized albumen. Of the three I think I give the preference to the latter, as producing the richest tones and best general effect; but the negative, to bear printing by it, must have an extremely hard glossy surface, and not be touched up with colour, except where inevitable to conceal spots, as the albumen has a considerable tendency to adhere to such places, or indeed any part of the negative, and pull off small pieces, which process by no means augments the subsequent value of the negative. To sum up, to print a wet collodion negative on glass, I suggest the use of oxymel, or gelatine, as not so destructive to the plate; but where the plate is the result of a dry process, and therefore possesses the hard surface usually given thereby, I should say use the albumen process, which I will now describe. I recommend a collodion of rather spongy nature, which when rubbed up by the finger powders or crumbles up, rather than a tough contractile film, which often contracts in drying, and either cracks off or spoils the picture by distortion. Where a collodion specially made for dry plates is not at hand, it is very useful to mix any good negative and positive collodion in equal parts, and use the mixture. I have often by this means produced extremely good results.

It is of great importance to have the collodion perfectly free from specks or floating particles of any kind, in fact, if anything, it is even more important than in taking negatives, as every blemish is here brought so palpably before the eye, and cannot be obliterated. For this process the only addition to the photographer's apparatus is two baths of stereo size placed adjoining the nitrate bath. The latter preparation is exactly the same as used for negatives, nearly neutral, quite clean from floating particles, and fully up to 30 grains to the ounce. I need scarcely say that where the negatives to be printed are taken by a binocular camera, it is necessary to cut them in halves before commencing, and to fasten the halves *round* on a stereoscopic glass, adjusting them in the stereoscope to their proper position, and being careful to obtain the best stereoscopic effect. It will be found that thin-flatted crown glass answers perfectly for transparencies, though the original negatives are of course on patent plate.

The albumen preparation is thus made:—

Pure albumen	1 oz.
Aq. dist.	6 oz.
Am. fort.	30 minims

Agitate them well together, and after twelve hours settling filter through a sponge. In addition to the usual nitrate bath, have a bath, stereoscopic size, of distilled water close at hand. Collodionize, as usual, but allow the film to set for one minute before immersion: on removal from the bath, in three minutes, set up the plate, corner ways, to drain into a glass, and meanwhile immerse another plate in the nitrate bath. I find it of some importance that the upper corner of the plate should rest, while draining, against a sheet of glass placed for that purpose against the wall, as both during draining, and also the subsequent final drying, any woodwork, or even sometimes paper, appears to cause markings on the plates.

When the plate has sufficiently drained (in three or four minutes) remove it to the distilled water bath, and work up and down until the oily appearance of the surface is entirely gone. When this is accomplished, hold it under a stream of common water, either from a tap or a jug, and wash it thoroughly, back and front. Having drained slightly, pour on at one corner a drain of the albumen mixture, and work it well to all parts of the plate, then wash off again with common water, giving it a considerable quantity on all parts of the plate. Now set aside to dry, standing on a glass or small gallipot into which it may drain, and the upper corner touching only glass, as before directed.

If the temperature of the room is not below 50° the plates will dry spontaneously in an hour or so; but if they are wanted for immediate use, a hot-water box may be used with great advantage. I employ such an one for Fothergill's and other dry processes with the best results.

The sides and bottom of this tin box are made double, on the principle of the hot water dish, and hot water is poured in by the funnel at the end. When the plates have ceased to drip, they are placed in the box face to the side, on blotting paper, and the lid shut down, they will then become thoroughly dry and hard in a few minutes, the steam passing off through a ventilator in the lid.

I find these albumenized plates for printing keep for any length of time, often six months, being as good as ever. My practice is to keep my stock of dry plates in mahogany grooved boxes, in which they undergo no deterioration. The surface is extremely hard, and if the collodion be well formed they are as clear as opal glass.

(*To be continued.*)

ON THE NEUTRALIZATION OF THE NITRATE OF SILVER BATH BY CARBONATED ALKALIES.

BY T. A. BARBER.*

Some three or four years ago I recommended oxide of silver

* Read at a meeting of the North London Photographic Association, April 24, 1861.

for correcting free nitric acid in the exciting bath: this and the carbonate of silver are the only additions that can be made to effect the object and at the same time preserve its integrity. It is, however, found in practice that there are many combinations of nitric acid which are not injurious, so this method is rarely adopted, the alkaline carbonates having the preference, as, being always at hand, they are the most convenient.

It is not my object in broaching this subject to condemn the use of alkalies, but just to point out a source of error that may arise from using the carbonates.

Carbonic acid gas is to some extent soluble, or rather it is tenaciously held in combination by aqueous solutions, so that when we add a carbonate to an acid it is only after waiting till the gas escapes or is driven off by heat that the fluid becomes in a fit state to receive the test paper. One of the best illustrations of the power of carbonic acid to redden litmus paper in the presence of an alkali is that of dipping it into a newly-opened bottle of soda water; the reaction is the same as if dipped into vinegar.

I recollect once reading in the list of "Answers to Correspondents" in *The British Journal of Photography*, a reply to one who had been adding carbonate of soda at the rate of a drachm to a pint of bath, without being able to neutralise the acidity. Now this was very likely to have been the fact; but the acid that changed his test paper was no doubt carbonic acid, which he had not allowed to evaporate before seeking advice. This applies in some measure to all cases when a carbonated alkali is used, more or less apparent according to the proportion of acid originally present.

Carbonate of silver is also open to the same objection, nor does it very readily part with its carbonic acid. I have exhausted my patience in endeavouring to dissipate the acid reaction on litmus paper by adding this carbonate. The remedy is, of course, time, or boiling the solution: we then get a bath absolutely neutral.

Wanting the oxide, I should recommend the caustic alkalies as preferable—it matters not which: ammonia forms no exception. There is no danger of spoiling the bath by an overplus; for, although it may be made alkaline, this alkalinity is in no case due to the adjunct, but to the formation of free oxide of silver, which, after filtration, is easily corrected. In fact, the point of saturation is passed when turbidity commences, and whether the bath be acid or alkaline it is immediately available to test paper.

The alkaline acetates are sometimes used to correct free nitric acid, but are open to the objection that there is no knowing when the decomposition is completed, and we have to guess as to whether we leave nitric acid or form more acetate of silver than we intend.

The objection to the employment of oxide of silver for neutralizing free acetic acid applies equally to the use of carbonate of soda: acetate of silver is formed in both instances—directly by the oxide, and indirectly by the latter. The soda unites with the acetic acid, forming acetate of soda, then double decomposition follows with this and the nitrate of silver, resulting in nitrate of soda and acetate of silver.

It has been recommended of late to use recrystallised nitrate, as being the purest form of obtaining it. Formerly the fused was said to be the best. There is no doubt that the oftener you repeat the process of crystallisation, each time rejecting a portion of the mother liquor, the purer will be the result. This method is necessarily much practised in organic chemistry, but is quite inexcusable when dealing with nitrate sf silver.

My advice to photographers is to buy their nitrate as cheaply as the competition of manufacturers allows them, and doctor it themselves with oxide. This, with the influence of light, will free it from both acid and organic matter, leaving a solution purer than is attainable by any other means. Let them also bear in mind that recrystallisation is no guard against sophistication.

SPECIFIC GRAVITY OF NITRATE OF SILVER SOLUTIONS.

BY GEORGE DAWSON, A.M.

Table for ascertaining from the Specific Gravity to the nearest grain the amount of Nitrate of Silver contained in one fluid ounce of pure solution, at 60° Fahrenheit.

Grs. in fluid oz.	Sp. gr.	Grs. in fluid oz.	Sp. gr.	Grs. in fluid oz.	Sp. gr.	Grs. in fluid oz.	Sp. gr.	Grs. in fluid oz.	Sp. gr.	Grs. in fluid oz.	Sp. gr.
10	1021	32	1063	54	1105	76	1146	98	1187	120	1227
11	1023	33	1065	55	1106	77	1148	99	1189	121	1229
12	1025	34	1067	56	1108	78	1150	100	1191	122	1231
13	1027	35	1069	57	1110	79	1152	101	1193	123	1233
14	1029	36	1070	58	1112	80	1153	102	1194	124	1235
15	1031	37	1072	59	1114	81	1155	103	1196	125	1236
16	1032	38	1074	60	1116	82	1157	104	1198	126	1238
17	1034	39	1076	61	1118	83	1159	105	1200	127	1240
18	1036	40	1078	62	1120	84	1161	106	1202	128	1242
19	1038	41	1080	63	1122	85	1163	107	1204	129	1244
20	1040	42	1082	64	1123	86	1165	108	1205	130	1245
21	1042	43	1084	65	1125	87	1167	109	1207	131	1247
22	1044	44	1086	66	1127	88	1168	110	1209	132	1249
23	1046	45	1088	67	1129	89	1170	111	1211	133	1251
24	1048	46	1089	68	1131	90	1172	112	1213	134	1252
25	1050	47	1091	69	1133	91	1174	113	1215	135	1254
26	1051	48	1093	70	1135	92	1176	114	1216	136	1256
27	1053	49	1095	71	1137	93	1178	115	1218	137	1258
28	1055	50	1097	72	1138	94	1180	116	1220	138	1259
29	1057	51	1099	73	1140	95	1181	117	1222	139	1261
30	1059	52	1101	74	1142	96	1183	118	1224	140	1263
31	1061	53	1103	75	1144	97	1185	119	1226		

CORRECTIONS FOR TEMPERATURE.—For every 10° above 60° add 1 grain; and for every 10° under 60° deduct 1 grain.

[This table was presented and explained at the meeting of the North London Photographic Association, on the evening of Wednesday, April 24th, in completion of the valuable labours of Mr. Dawson in the analysis of silver solutions. Its object will be best understood by a reference to Mr. Dawson's former papers in our columns, and to the reports of recent meetings. We may state, however, that the table gives accurately the precise quantity of pure nitrate of silver in a measured ounce of the solution, for all strengths, from 10 to 140 grains, the usual sources of error having been eliminated by careful experiment and calculation.]

MOUNTING PHOTOGRAPHS.

BY THOMAS GULLIVER.

Amateurs and others only requiring to mount a print now and then often find it inconvenient to prepare starch paste in small quantities; but the following mixture, when once made, will keep for months ready for use. It is smooth as oil, easy to prepare, does not thicken, and will stick like glue; it also has the advantage of not cockling the prints so much as the ordinary starch paste—

Picked white gum-arabic	½ oz.
Dextrine	2¼ oz.
Liquid ammonia	4 drops
Water	8 oz.

The gum arabic is to be pounded in a mortar, and mixed with the dextrine; then rubbed in the mortar, with two ounces of the water, till quite smooth; then the rest of the water added, and boiled in an enamelled saucepan for ten minutes. When cold, it may be put into a wide-mouthed bottle, the ammonia added, and thus kept for use.

17, *Heathfield-street, Swansea.*

Dictionary of Photography.*

Prism.—The prism used in optics is a triangular piece of glass, which decomposes a ray of light passing through it, and produces the prismatic spectrum.

Process.—The term process is a very common and useful one in photography, and describes the entire formula and manipulations used in producing any distinct class of pictures, as the "positive process," and the "negative process"; or any distinct method of producing similar pictures as the "dry collodion process," and the "wet collodion process."

Protosalts.—Various metallic bases combine with oxygen and other elements in different proportions, and the prefix *proto*, meaning first, is applied to those combinations in which one equivalent of the base, and one equivalent of oxygen, or other element, are united. Thus protoxide of iron contains one equivalent of oxygen, and one equivalent of iron. The term protoxide would naturally suggest that it was applied to the first combination which could be formed; this is not always done, however, in practice, as where the combination contains less than one equivalent of oxygen, the term suboxide is used. The highest binary compound of the same element is distinguished by the prefix *per;* thus the peroxide of iron contains the largest amount of oxygen which combines with that base. As the developing powers of the protosalts of iron exist in virtue of their affinity for oxygen, it follows that as soon as they are satisfied by acquiring all the oxygen with which they can combine, and become peroxidised, the developing power ceases. The same prefixes are used to indicate the same combinations of metallic bases with other elements, such as chlorine, and hence we have subchlorides, protochlorides, and perchlorides, &c. The exact proportions of other combinations are indicated by other prefixes, into which it is unnecessary here to enter.

Pyrogallic Acid.—This is a substance with which the photographer is very familiar, having been for many years the chief developer used in the negative processes. Although styled an acid, it is neutral, and does not redden litmus paper; it forms no salts. It is formed by exposing gallic acid to a temperature of from 410° Fah. to 420°, which produces decomposition, and a yellowish white sublimate of white lamellar crystals is formed, which is pyrogallic acid. It is very light, and easily soluble, either in water, alcohol, or ether. From its affinity for oxygen, it is valuable as a developer, acting with less energy than the protosalts of iron, but giving a more organic deposit, and is thus valuable in the production of negatives. The aqueous solution soon becomes discoloured from the absorption of oxygen, and loses its developing power. A concentrated solution in alcohol, if kept carefully stopped, will retain its efficacy some months.

Pyroligneous Spirit, known also as pyroxylic spirit, wood alcohol, and wood naphtha, is a substance resembling alcohol in many respects, but belongs to the methyl series, and is obtained by the destructive distillation of wood. It is miscible with water, alcohol, and ether: its specific gravity at 60° is ·800. It is neutral to test paper, and permanent in the air. It has a strong pungent taste and smell, which renders it easy to detect in the smallest quantities. It is used, in connection with photography, for burning in spirit-lamps, as a solvent for varnishes, and, indirectly, very largely in the manufacture of collodion.

Its use in the manufacture of collodion arises from its presence in "methylated spirits." To explain this, it is necessary to state that the heavy Government duty on pure alcohol renders it an expensive article for use in the manufactures. To meet the difficulty arising from this, as a check to trade, a method was devised for removing this heavy duty on alcohol intended for chemical and manufacturing purposes. To guard against the application of untaxed alcohol to drinking purposes, it was enacted, some years ago, that alcohol might be sold free of duty, provided it was mixed with ten per cent. of wood spirit, the pungent odour and taste of which would render it unfit for use in any way, as a beverage. It may be purchased so in quantities of not less than twelve gallons, the purchaser giving security for its being applied to its legitimate purposes, and undertaking not to retail it except in combination with some gum: shellac,—at the rate of an ounce to the gallon is prescribed, we believe,—its use as a solvent for varnishes and French polish having been chiefly contemplated.

Large quantities of ether, sold as methylated ether, are manufactured from methylated spirit; and this ether, and the spirit itself, is used extensively by manufacturers of collodion, by the makers of the cheaper sorts especially. Much discussion has arisen, at different times, as to the propriety of its use, and the influence it had on the character of the collodion. Mr. Hardwich came to the conclusion, after some experiments, that whilst an excellent collodion might be manufactured from it, the stability was less than when pure spirits were used. Instability, insensitiveness, overdensity, and a tendency to throw the nitrate bath out of order, have been the chief objections alleged against the use of methylated spirits. And these charges have been supported as necessary, from the fact that the worst samples, both of alcohol and of wood spirit, were used in preparing the commercial methylated spirits. On the other hand, the addition of a small portion of pyroxylic spirit to collodion made in the pure alcohol, used at one time to be commonly recommended, for the purpose of preserving its sensitiveness. This notion probably arose, however, from the property this spirit seems to possess, especially in the presence of a bromide, of preventing the darkening of collodion from the presence of free iodine, as it grows old.

Where the methylated ether and alcohol can be obtained pure, we see no reason to believe they exercise any deteriorating influence whatever on collodion, and the various bad effects which have been attributed to these solvents for pyroxyline, have most probably arisen from the use of impure samples. Methylated spirits, highly rectified, and doubtless freed from much of their impurity, can be had of a specific gravity of 805 at a much less cost than pure spirits, as usually sold 56 or 60 over proof, that is of a specific gravity of 840 or 830. We have used the methylated alcohol ourselves, for various purposes in connection with photography, for some years, without having in any instance detected any injurious result. Those photographers who are however anxious to avoid its use, may readily detect its presence in any sample of collodion by dropping a little on the hand and rubbing it for a few seconds. The smell of alcohol and ether will soon evaporate and leave the characteristic pungent odour of the methyl, which is much more persistent in remaining.

* Continued from p. 189.

Photographic Tourist.

PHOTOGRAPHIC RAMBLES IN WALES.—No. 2.*

BY J. H. JONES.

AFTER leaving Morristown behind me for about half a mile, at a sudden curve in the road I came to a group of thatched cottages, which appeared so piquantly beautiful in their rustic simplicity, that I must, perforce, stop to take a view of them; the ivy climbing up in all directions over them, and then spreading over the roofs, added a charm not often to be met with.

Crossing the canal at this point, which was near a colliery, I walked along the towing-path for a short distance, and stopped again to take a view of the canal, which at this point presented a picture in which the light and shade were so harmoniously blended, that it surpassed anything I had ever met with on a canal side; the stunted trees on the western side drooping downwards to the water, to which several coal barges were moored, formed the foreground, while the middle was occupied by a small ivy-covered bridge, through the arch of which another bridge could be seen in the distance, while the light streaming through the trees on the side of the towing-path threw the light and shade about in a manner which beggars description. There are several other nice little "*bits*" to be had between this and the second bridge mentioned above, at which point I regained the road.

Following this road I passed Fountain's Hall, which has some pretensions to architectural beauty; the road is lined for a considerable distance with trees, which form a very agreeable shade from the heat of the sun, and at the same time gives it a very rural aspect: passing onwards, I came to a village called Buildings, near which, on the right hand side, by a gate, there is a delightful scene; right below me was the canal, and by the side of it was the river Tawe, which, rolling over its pebbly bed, sent up such a murmuring, babbling noise, which struck most musically on the ear, while the cottages and farms dotted here and there the lovely green meadows, in which cattle and sheep were quietly grazing, and the hills rising up in stately grandeur and stretching far away in the distance, formed the background, and made the scene at once picturesque and beautiful. Soon after leaving this village I found myself at Clydach, and just after passing the reading-rooms, and about the centre of the village, a charming view presented itself; immediately in front of me was a cluster of cottages, built on the sloping banks of the river, while a little to the right was a rustic wooden bridge thrown across the canal, and to the left a small bridge across a minor stream, and in the centre a large three-arched stone bridge, at the back of which were the ruins of an old mill, while the water coming down from the hills at the back rushed foaming along over its rocky course; Clydach Church, a little further on, is rather a pretty one for a village church, but being very modern I did not stop to photograph it. From this point until I reached the outskirts of Pontardawe, my walk lay through a perfect avenue of trees, and tastefully cut hedgerows. Near the Mason's Arms, on the right-hand side of the Pontardawe road, as I entered the village, there was a gap in the edge, and not wishing to lose anything that could be seen, I entered it; and here I found another view which appeared so very nice in the declining sun that I determined to secure it; the field in which I found myself sloped gradually to the canal side, which was strewed here and there with barges, whose long, black, slender forms cut sharp and clear the bosom of the canal they rested on, while below them on the marsh between the canal and river, a tin-works, with its numerous flues, and behind them the river, which was spanned by a graceful bridge of one arch, near which stood an old elm-tree, whose giant form seemed like the "spirit of the scene," while, beyond the bridge, the flat, green fields vanished away in the distance; and on the opposite bank to where I stood was the Pontardawe railway and station, and above that the village of Alltwen, whose numerous white cottages speckled the hill, like a field of daisies; as soon as my plate was exposed I passed on, entered the village, and looked about me for quarters for the night. Early the next morning I was out in search of the local beauties of the village, and the first object which attracted my attention was the church (Eglwys Newydd) whose tall and graceful spire glittered in the early morning sun; it is so placed that it can be seen from any point in the village; I, therefore took three distinct views of it, the first from a lane on the east side, the second from the banks of the canal; in this view I had what some would call a perfect medley, first, there was the canal, then a bridge, a considerable portion of the village, and then the church itself on an eminence behind; the third view was from a field on the west side; as soon as this was finished I made a closer inspection of it, the work on the exterior surpasses anything of the kind to be met with in a country village; the interior gives several most beautiful pictures; as I entered the doorway, which is directly under the belfry, and turned to my left, I was in raptures, the beautiful pillars springing from the tesselated aisles, and running up for forty or fifty feet, and then uniting in gracefully carved arches, while at the far end of the church was the chaste and tastefully carved pulpit, reading-desk, and font, all in white stone, and further on an exquisitely beautiful screen of the same material in front of the choir, lit up here and there by the sun streaming in through the western windows; only one thing is wanting to complete the beauty of this graceful church, and that is the insertion of the painted window in the chancel, which, from what I have heard, will soon be done. After making pictures of all I wished here, I left this sacred edifice and returned to Nature's own temple, whose floor is the green and beautiful earth, whose pillars are trees, whose roof is the blue and glorious sky, and whose choristers are the birds, whose tuneful throats sing praises to *Him* who made all things beautiful.

Turning up a lane opposite the Cross Inn, I soon came to Cwm Dû (Black Glen). Turning aside from the lane proper I followed one which descended to the brink of the stream, a tributary of the Tawe: here indeed was a pretty scene, a small waterfall some two hundred yards from where I stood appeared, owing to a curve in the stream above the fall, to rush out of the foliage which clothed the banks of the dingle, and coming down with many a twirl and eddy, ran on its never ceasing course; with here and there a tree covered with moss bending over the water, whose branches seemed like giant arms, longing to embrace the stream, which laved its roots, and supplied it with nourishment; a cottage built on a jutting piece of rock some forty or fifty feet high, seemed like the palace of the fairy who presided over the scene below; while in the background, the waving corn might be seen clothing the hills to their very top. After impressing the image of this view on a plate, I retraced my steps until I reached the point of my deviation from the lane.

I now ascended the hill for a mile or so, until after passing Gellyonen House, I came to a style, crossing which, I found myself in a narrow pathway, which led in a zigzag direction to the bottom of the glen, another portion of the one mentioned above, which cannot be reached by any other way; I stopped occasionally on my way down to photograph some studies of fern and bits of rock, which appeared here and there, so unusually beautiful in the light which streamed through the foliage; that they were really irresistible. There is one view, about half way to the bottom, which particularly struck me as interesting, through an opening in the trees, which appeared to be made on purpose, a stream of water rushed over the rock which formed the other side of the dingle, which being rather steep, made a fall of considerable beauty, the foliage on both sides of the

* Continued from p. 190.

dingle being of a diversified character, added to, rather than detracted from its merit.

When I gained the bottom of the footpath, I found myself on a bed of pebbles, with here and there an immense boulder, which had, no doubt, in years gone by, been torn from the wall of rock which faced me, where I stood, but which was now, by the continual force of the stream, rounded off, and appeared like huge pebbles, the wall of rock from which they had been torn was now hung with creeping plants from whose pendant branches water was continually dropping. Turning a little to the right, the stream was seen to come round a curve in the glen, with such force, as plainly indicated to the eye, as the noise did to the ear, that a fall of some magnitude was close at hand. The scene from where I stood was indeed one of more than ordinary beauty; the dingle on both sides, was covered with trees, among the foliage of which the birds sang, and the lively squirrel gambolled and frisked, in the radiant sun, while the water foaming and tossing below, occasionally dashed the spray over the large masses of stone in its bed, like mimic waves.

It was with difficulty that I could tear myself away from this spot, but making my way forward and upward, for the stream could not be forded, I soon found myself on a projection which overlooked the fall, which threw itself over a rock some twenty feet in depth; but it is so placed, that I could not make a satisfactory picture of it, owing to my being on a level with the top of it, and not about thirty feet from it: this I very much regretted, because the surrounding scenery would have made a picture of especial beauty.

After exploring the stream for a considerable distance above the fall, and selecting such "bits" as particularly struck my fancy, I turned my face backwards, and arrived in the village just as the sun was gilding the top of the church spire.

(*To be continued.*)

Proceedings of Societies.

North London Photographic Association.

The usual meeting was held on the evening of Wednesday, April 24th, at Myddelton Hall; Mr. G. Shadbolt in the chair.

After the usual routine proceedings, the following new members were elected: Mr. Alexander, Liverpool; Major Burt, Nottingham; Mr. J. Harrison, Hull; Mr. E. Steegman, Nottingham; and Mr. Purnell.

Mr. T. A. Barber read a paper on "the Neutralization of the Nitrate of Silver Bath by Carbonated Alkalis," (see p. 209). After which he explained that one circumstance which had induced him to read this paper, was the fact that having formerly recommended the use of oxide of silver for neutralizing the bath, he had recently seen it stated by one of our photographic authorities, that it was a mistake to use oxide for such a purpose. He could not but think, however, that it was at once more scientific and simple, as it was only adding silver to the bath, whilst other methods added foreign matter in some shape.

Mr. Dawson entirely agreed with Mr. Barber as to the use of the oxide, than which he thought nothing was better for the purpose. He had tried both ammonia and carbonate of soda, but the bath soon got out of order. The oxide being insoluble in water was the only thing which ought to be used for the purpose, the nitric acid being neutralized by combining with the oxide of silver to form the nitrate, thus chemically speaking it was perfect, and practically speaking he had found it the best plan. With respect to Mr. Barber's remark on recrystallisation, he thought that by repeated recrystallization the organic matter was removed. He had tried it four or five times, and he always found the first crop of crystals to be purer than those which were subsequently obtained from the same solution. The "mother liquor" held the organic matter, but it need not be wasted, as it could subsequently be used for printing. Nitrate of potash could not, of course, be got rid of by recrystallizing; if it did not crystallize with the nitrate of silver, small crystals of it would get entangled with them, and it would be never entirely got rid of.

The Chairman said Mr. Barber's remarks applied chiefly to freeing the nitrate of silver from organic matter.

Mr. Barber said his remarks applied also to getting rid of the nitric acid. A good deal might be driven off by boiling.

Mr. Dawson had not found it difficult to buy good nitrate of silver, that which he had bought contained no adulteration but water and nitric acid. The best way to drive off the nitric acid when pure nitrate was desired was to pound down the crystals, and to keep them for a few hours in a shallow dish over a water bath. A solution made from crystals thus prepared would be found perfectly neutral. It was generally supposed that nitrate of silver could not be decomposed into nitrite except at a high temperature. One Saturday night he put some nitrate of silver, slightly acid, into a shallow basin in a water bath over a gas jet, and forgot it until the following Monday morning, when he found the nitrate of silver, which during that time could not have been at a higher temperature than that of boiling water, was decidedly alkaline, and in part converted into nitrite. This shewed that long-continued moderate heat—this was about 40 hours—would decompose the nitrate of silver, whilst a shorter exposure, such as five or six hours, produced no such decomposition. Every specimen of fused nitrate he had seen contained nitrite, and he did not think it was possible to fuse it without forming nitrite.

The Chairman observed that they had a visitor—Mr. Sutton, who he thought had been alluded to by Mr. Barber, who had thrown out a sort of challenge to him. Would Mr. Sutton take up the glove?

Mr. Sutton said he had been making many inquiries lately on the subject of nitrate of silver, owing to the prevalent complaints of its bad quality, and had obtained much interesting information. It appeared that the bulk of the nitrate of silver sold by different dealers was manufactured by one firm, by whom it was produced, not by the direct action of pure nitric acid on pure silver, but as a bye-product in the purification of gold. This metal, when it arrived in this country from Mexico, Australia, and other places, was first granulated, and then subjected to the action of strong nitric acid, which dissolved all the silver, forming nitrate of silver. The process of recrystallizing, as it was called by many firms, was nothing more or less than picking out the finest and largest-looking crystals, to sell at a higher price. If, however, the nitrate of silver obtained in this way were recrystallized, and the first crop of crystals were selected, they would be tolerably pure; and on evaporating and fusing the residue, instead of being clean and white, it would be found of a dirty tawny colour, particularly at the bottom of the evaporating dish. If this dark brown stuff were made into a nitrate bath, and the first crop were made into another, the results would be very different. The pure crystals would give rich, clean, vigorous negatives; the other, thin grey negatives, with veiled shadows, streaks, and all manner of abominations. If, then, a bath were made of the crystals, as at first obtained, before this separation had taken place, all the impurities would be present, and all the bad results, although perhaps in a slightly mitigated degree, would follow. The next question was, what were these impurities? Mr. John Williams and others had submitted this brown residue to a great heat, to carbonize any organic matter and get rid of it, but still something remained. Mr. Williams believed this to be a sulphate. He had added nitrate of baryta to the solution, and, although no cloudiness was produced, he had obtained a solid residue on evaporation, which he believed exhibited unmistakeable evidence of the presence of sulphur. Sulphuric acid was undoubtedly present in some samples of nitric acid; and if, in forming the nitrate of silver, silver were added in excess, when the nitric acid was exhausted, sulphate of silver might be formed. Mr. Williams, having carefully tested, had come to that conclusion. Assuming this to be true, the way to make pure nitrate of silver was to get pure granulated silver in the first place, and then to get pure nitric acid. To obtain the latter, any nitric acid might be taken, add to it nitrate of baryta, and then redistil it: dissolve in it the pure silver, and there was then obtained nitrate of silver as pure as it could be got. In recrystallizing this nitrate of silver they would not get colourless crystals, unless they added to the solution a very few drops of nitric acid, just sufficient to give very slight acidity. The first crop of crystals should be taken for a pure nitrate bath.

Mr. Barber thought that it might easily be tried if similar evil effects arose by adding a sulphur compound direct to the solution. He thought, however, the presence of organic matter alone was sufficient to account for the troubles complained of.

Mr. Dawson said a considerable source of trouble arose from the manufacture of silver direct from the oxide, or from the spongy silver reduced by means of zinc. This was an operation which could never be completely effected. He lately had about a pound of waste chloride of silver, which he reduced to spongy silver by adding zinc: after washing it he added rather an excess of sulphuric acid to remove the zinc. He evaporated the liquor, and then washed the precipitate until all trace of acidity disappeared. He then added nitric acid, and placed the solution in an evaporating dish, and kept it over a water-bath until it was a concentrated syrup, without crystallizing. He then made a solution, of about the strength of ninety grains to the ounce, for printing purposes; instead of a clear solution it was very turbid, which he could not account for, seeing that the syrup was perfectly clear. The filtrate from this he found to be chloride of silver. It arose from some of the chloride not being reduced by the zinc; and the chloride was not soluble in nitric acid. Spongy silver should not, therefore, be used for making nitrate of silver; it should always be fused, with a little lime and charcoal mixed with it, when it would form perfectly pure nitrate of silver.

Mr. Hughes had some years ago met with an exactly similar result. He had a quantity of chloride of silver, he had reduced it by the ordinary zinc method, and had then redissolved it in nitric acid, filtered it, and, on diluting it to a working strength, to his astonishment down fell a quantity of precipitate, showing that the chloride of silver was soluble in the strong nitrate of silver, but not in a weak solution.

Mr. Sutton suggested that it might be sulphate of silver which was precipitated.

The Chairman said it was well known that chloride of silver was, to a certain extent, soluble in a strong solution of nitrate of silver. There was one point to which Mr. Sutton had not alluded: Mr. Barber's paper appeared to him to be directed against some remarks made by Mr. Sutton to the effect that oxide of silver should not be used in neutralizing the bath.

Mr. Sutton said when oxide was added there was sure to be too much put into the bath; and then, to counteract that, too much nitric acid would be added, and so on, *ad infinitum*, whereas, when carbonate of soda was used in excess, carbonate of silver was thrown down, which had only to be filtered out, and the bath was neutral.

The Chairman observed that carbonic acid still remained.

Mr. Sutton said that he thought that was got rid of in filtration.

Mr. Dawson did not see any reason for adding an excess of oxide to the bath; it was insoluble in water, and it could be added in infinitesimal quantities.

Mr. Barber said a little oxide of silver was soluble in water.

Mr. Sutton added that the smallest excess would produce fogging.

Mr. Barber inquired whether Mr. Sutton considered it necessary to have his bath a little acid to make it work well, as he could not obtain satisfactory results with a perfectly neutral bath?

Mr. Sutton replied that with good collodion he could employ a neutral bath, but not with a cadmium collodion.

The Chairman said it was very easy to add a little free iodine to the collodion.

Mr. Sutton said it was notorious that a cadmium collodion could not be worked satisfactorily in a neutral bath when fresh iodized.

The Chairman had so used it.

Mr. G. Wharton Simpson said that Ponting's collodion, which was generally believed to be iodized with cadmium, was well known to improve by age, and the maker said it was better six months after iodizing than at first. Mr. T. R. Williams had recently informed him that some which he could not work when he first had it from Ponting, was in fine condition when he tried it twelve months afterwards.

Mr. Dawson asked if it were certain that Ponting's collodion contained a cadmium iodizer? The crystals obtained by evaporation when examined under a microscope were unlike those of cadmium.

The Chairman said that was scarcely a satisfactory test, as it was astonishing how different in form crystals would appear when contaminated with a little organic matter; their form was materially altered.

Mr Barber asked if good pictures could be obtained from a strictly neutral bath.

Mr. Dawson had obtained the best possible results so.

Mr. Simpson said when the bath was absolutely neutral every thing must be in the most perfect condition, as the presence of the smallest amount of foreign matter was sure to be indicated on the plate. The collodion must be good, and the manipulation careful.

The Chairman remarked, in reference to Mr. Sutton's statement regarding the presence of sulphur, that it would be foolish to say, in reference to any photographic experiment, that such and such a thing was impossible; still it seemed to him strong evidence against the presence of sulphur, that no cloudiness was formed on the addition of nitrate of baryta to the solution.

Mr. Dawson said the salts of barium were the most delicate tests for the presence of sulphuric acid, and that acid would not attack silver so long as there was an excess of nitric acid present.

Mr. Simpson said that Mr. Sutton had suggested that when there was silver in excess, and the nitric acid was exhausted, the sulphuric acid, if any were present, would begin to act upon the remaining silver.

The Chairman said even in that case the sulphuric acid would not attack the excess of pure silver: to do so it must be oxidized.

Mr. Sutton said boiling sulphuric acid might act in the silver, or the silver might have become oxidized by contact with the nitric acid. Mr. Williams had actually detected sulphur in combination with silver. That was a fact not to be explained away. It might be a sulphide or other sulphur compound; he did not insist on its being sulphate.

The Chairman said he could easily see the possibility of *sulphide* of silver being present.

Mr. Highley asked if Mr. Hardwich had not examined this question.

The Chairman said Mr. Hardwich had experimented as to the presence of organic matter only—not as to the presence of sulphur compounds.

Mr. Hughes said if the presence of sulphur had been discovered by analysis, it would be easy to prove the matter further by synthesis. The question might be easily decided by adding sulphur in some form to a nitrate bath, which ought to produce exactly the same results and appearances alluded to by Mr. Sutton, if his supposition were correct. That would be the complement to Mr. Williams's experiments, and would decide the question definitely, if any martyr to science would spoil his bath for that purpose.

Mr. Dawson then brought forward the table he had resently constructed for ascertaining the amount of nitrate of silver in a solution by means of its specific gravity, and proceeded to explain the precise and laborious steps he had deemed necessary for ensuring the utmost exactness. He had not trusted to the graduated measures usually supplied, but beginning with everything, *ab initio*, had graduated his own measures, the method used in effecting which he explained. Where he had used a standard salt solution, he had not relied either on the purity or dryness of the chloride of sodium, but had ascertained the exact strength by testing it with nitrate of silver made from pure silver dissolved in nitric acid, and ascertaining the amount thrown down by the salt solution. After forming the table by means of operations and calculations conducted on one method, he checked it by going over the whole again by a series of experiments conducted on a different method, and on doing so found that the table was exactly correct. He explained how the increase of the solution in *bulk* on the addition of silver entirely rendered any plan nugatory which was based on the measurement, first of the water, then adding silver, and ascertaining the specific gravity of the solution, as one ounce of distilled water and, say sixty grains of nitrate silver, would make more than one ounce of nitrate of silver solution; and the increase of bulk was not simply in the ratio of the addition of silver, but increased upwards. As regarded the value of the table, unless some one would go through it again they only had his word for it, but he could give them the fullest assurance that it was correct and reliable. (See p. 210.)

Mr. Hughes said that they could not separate without some very definite expression of the value of Mr. Dawson's labours; nor allow him to think that the great skill, untiring patience, and beautiful accuracy of his results went for nothing. Up to that moment no definite connection had ever been established between the specific gravity of distilled water, at 60° Fah., and that of solutions of nitrate of silver. All experiments showed how much depended on a knowledge of the exact proportions of that salt in their solutions; and Mr. Dawson had come forward to give them a new power. He (Mr. Hughes) should not have felt called upon to dwell upon this subject, but that Mr. Dawson, in his modesty, had not done himself justice, nor insisted with sufficient emphasis on the value and importance of his work. That table possessed an especial value, as proving a fact they might not have anticipated. The natural inference would have been that, having established the increase of weight and increase of volume for one proportion, it would stand the same for all strengths. But Mr. Dawson, having discovered a slight tendency to deviation, had pursued the examination, and they now had the exact statement of all strengths they would require to use, thus affording them a test of almost analytical accuracy, by the simple means of specific gravity. With such valuable results obtained, he could scarcely regret that he had, in the first instance, opened this discussion, although had he known all that was going to arise out of it he should scarcely have commenced it; still he could not but be gratified at the final results. Mr. Dawson had shown them now, and in his previous papers, how many and various the sources of error that beset such examinations, and that no mere rule-of-thumb method was of the slightest avail. That, instead of many of the methods in use giving even approximately correct results, the slightest deviation at any one point led them very wide of the mark indeed. The principle of estimating, by means of specific gravity, was shown to be correct; and if they were not content with the approximate results of the hydrometer, they could get absolute accuracy by means of the specific gravity bottle and this table.

After some further conversation on the relative value of Gay Lussac's method of estimating the quantity of silver and others, a vote of thanks was passed to Mr. Dawson, for the valuable information he had laid before them.

Various graduated measures, made by Mr. Dawson himself, and a very delicately-constructed pipette, graduated for every single minim up to 480 grains, which had been constructed for him by Messrs. Negretti and Zambra, together with a dropping-bottle, designed by Mr. Highley, were exhibited.

The Chairman announced that the Committee had been taking into consideration the propriety of altering the day of meeting from the last Wednesday in the month to the last Wednesday but one, so that they might get reports of their proceedings earlier than they did at present. He therefore gave notice that a motion would be made at their next meeting, which would be made special for the purpose.

The proceedings then terminated.

The American Photographical Society

The Society held its regular meeting for April, on Monday evening the 8th ult., in the Chapel of the University, New York; Vice-President Rutherford in the chair; John Johnson, Secretary *pro. tem.*

Harrison's New Lens.—The Vice-President, in reply to a question stated that the Committee on the new lens would probably be prepared to report at the next meeting. Mr. Harrison had been closely confined to his room by sickness for about six weeks. He had recently become convalescent, and was now preparing a very ingenious apparatus to be used in testing the lens. The apparatus is designed to overcome the difficulties in setting up an accurate drawing exactly perpendicular to the axis of the lens. The lens has been found on several occasions to be very useful in copying maps and paintings. Mr. W. H. Powell, the celebrated artist, has recently been commissioned by the Legislature of Ohio, to make an historical painting, commemorative of Perry's victory on Lake Erie. The preliminary sketch in charcoal has just been completed, and Mr. Powell was desirous of having a photographic copy produced. The sketch is twelve feet long and eight feet high. Application was made to several of our most skilful photographers, who, on examination of the case decided that it was impossible to make a copy unless the sketch could be removed from the studio to another room better lighted and longer. The attempt was about to be abandoned, when Mr. Harrison's lens was suggested, and the trial was perfectly satisfactory to all concerned; a good copy was made. The lens used has a focal length of twelve inches,* and stop of 4-10. The camera was placed sixteen feet from the sketch, and gave an image thirteen inches in length; the same lens would have taken in the whole view within twelve or fourteen feet, but would have made a copy larger than was desirable. (The Vice-President exhibited a print from the negative, which was passed among the members, but no one was able to discover distortion, deficiency of sharpness, or unevenness of lighting.)

Mr. Seely presented views of the exterior and interior of Mr. Anthony's store, made by one of the new lenses, and remarked that he was well satisfied of the great merits of the lens.

Mr. De Rahm presented a view of his studio made by the lens.

Printing and Toning.—Mr. Snelling then read a paper on the practical details of printing and toning.

Mr. Campbell.—Do you consider prints permanent which are made by your processes?

Mr. Snelling.—I have prints made five or six years which are not faded. My experience leads me to believe that prints toned in the acid bath are most permanent.

Photographic Notes and Queries.

Modification of the Fothergill Process.

Sir,—The albumenate of silver process being likely to have a pretty extensive trial, the following remarks may be of a little service to your non-chemical readers. It appears not indispensably necessary to have a "Fothergill collodion" for this modification. Always commence development with a minimum quantity of silver in the developer—a flat 12 or 16 oz. bottle laid in a porcelain tray makes an excellent developing stand. The formulæ I have succeeded with are in principle the same as mentioned by Mr. Hannaford, but my albumen is more dilute, and runs through the filter readily; it is made of

Albumen	1 oz.
Water	3 ozs.
Strongest ammonia	24 drops.

Shake, and when required for use add to every ounce 6 drachms of a 5-grain solution of nitrate of silver, shake and filter. Develop at this season with 1½ grain pyrogallic to the ounce, and 15 minims glacial acetic acid and silver solution, more or less, according to exposure.—I am, sir, yours, &c.,

Wm. Bartholomew.

Fareham, April 27, 1861.

Dear Sir,—In reference to Mr. Hannaford's modification of the washed albumen process (with all due respect for that gentleman), it does not obviate the markings and stains under the same circumstances upon the plates. Having just concluded my comparative experiments, which have extended over twelve months, I find them to arise from four causes:—1st, unsuitable collodion; 2nd, imperfect washing; 3rd, draining the plate; 4th, drying the plate.

If any benefit to your readers I will give my method in detail, the whys and wherefores, from the laboratory to the field, and bring them back with two good acquisitions—good pictures, good appetites.—Yours, &c. H. R. Nichols.

2, *St. Jude Street, April* 27, 1861.

[We have just received our correspondent s details of his method, which we will publish next week.—Ed.]

Yellow Glass for Dark Rooms.—Dissolve one ounce of shellac, one drachm of gum elemi, and one and a half ounce of powdered gamboge, in six ounces of vegetable naphtha; when the gums are quite dissolved, which will be in a day or two, decant the varnish off the dregs, and apply to the glass—quite dry, and rather warmed—with a broad camel-hair tool. It will be dry in a few minutes, and may then have another coat, or more, if requisite, to give the desired tint. The glass transmits a good softened yellow light, quite non-actinic. There is also the advantage that the varnish can easily be applied to existing windows, lanterns, &c., if desirable.

* From the back lens we presume.—Ed. P. N.

Talk in the Studio.

THE ECLIPSE PHOTOGRAPHS.—At a recent meeting of the Astronomical Society, Mr. DE LA RUE gave an account of the progress made in the preparation of tho photographs of the eclipse taken in Spain. He said it had been found necessary to enlarge them, and that hitherto the weather had been so unpropitious that, although he had spent twenty-one days by the side of the camera, no good result had been arrived at. He exhibited three photographs to show the sort of development obtained, and from an inspection of these, we think great things may be expected.

EXPLOSION OF GUN COTTON.—*Humphrey's Journal* records a serious explosion on the premises of one of the contributors to that journal. It states that :—"On the morning of Friday, the 29th of March, at about 9 o'clock, the numerous denizens of the vicinity were startled by the report of a most fearful explosion. Crowds of people soon rushed into the building, where a scene of destruction met their astonished vision. Many of the largo panes of glass in the front windows were blown clear across Canal Street. The three windows in the rear, where the laboratory is situated, were nearly demolished, and the whole of both sashes in the window farthest from the furnace, where the explosion took place, were blown into splinters. The glass partitions were all scattered into inch-pieces, and it is a great wonder that the building was not set on fire. Mr. Dornbach was standing in the centre of the room at the time of the explosion, and, wonderful to relate, escaped comparatively unhurt. On a sand bath over a hot fire was placed, in a large wooden box, upwards of ten pounds of gun-cotton in process of drying, when suddenly the whole exploded as if it had been a keg of gunpowder. Mr. D. says the room was filled with flame, which forced its way through the cracks and crevices of the board ceiling into the room above, scaring the inmates not a little; they thought the building was all in a blaze, but the woodwork was merely scorched. The brick wall was started by the explosion, The most singular part of it is, that a glass flask holding nearly a gallon of ether in process of being concentrated, and standing on a frail support directly over the cotton, was not disturbed in the least.

NEGATIVES WITHOUT A SILVER BATH.—A correspondent informs us that he has some specimens taken two years ago without a nitrato of silver bath, by a process similar to that referred to by Mr. Bellini; wo believe we shall have further particulars in our next.

PHOTOGRAPHIC SOCIETY OF SWANSEA.—Our esteemed correspondent, Mr. Jones of Swansea, is endeavouring to form a Photograbhic Society at Swansea. Mr. Llewellyn, well known as amongst the earliest successful photographic experimentalists, has consented to act as president. We commend the subject to the attention of our readers in the Principality, who we hope will not allow such a project to fail.

A NEW COLLODION.—A new field for experiment has recently been opened by Mr. Joseph Dixon, of Jersey City. Accident had thrown in his way a small quantity of the white fibrous substance found in the pod of the plant commonly kuown as the Milk-weed (*Asclepias*). The enquiry naturally arose whether this substance could be substituted for common cotton wool, in the manufacture of collodion. It was immediately subjected to the usual nitro-sulphuric acid treatment, and the substance produced was found to be highly inflammable and under the proper manipulation would undoubtedly have all the explosive qualities belonging to ordinary gun-cotton. The milk-weed fibre seems however to comport itself more like wool and similar animal substances, and undergoes a chango of colour from a pure glossy white to a dark yellow, indicating doubtless the presence of nitrogen in its composition. It dissolves as readily in ether and alcohol as the common gun-cotton. Mr. Dixon confidently expresses the opinion that this new substance possesses peculiar advantages, but a number of experiments are required to ascertain its behaviour under all conditions, and to definitely fix its value as a photographic agent. He has sent for another supply of the raw material, and hopes to report fully in relation to it at the next meeting of the society.—*American Photographic Journal.*

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, PATERNOSTER-ROW.

To Correspondents.

W. W.—We are glad you found our suggestion meet yout difficulty. 2. In copying anything with polished or varnished surface, such as daguerreotypes, glass positives, or oil paintings, it is necessary to place them in such a positiou that no reflected light is throwu from its surface iuto the camera. The best method of avoiding this will be decided by the position of your light; but two or three experiments will euable you to determine the position.

A. X.—The cause of the marks on your tannin plate is imperfect washing before applying the tanuiu. 2. The want of intensity iu a taunin negative is a new complaint, the cause of which we cannot tell. All we have tried and seen, have had a tendency to over intensity. 3 The length of exposure will be determined by the lens and stop as well as the light. At least six or eight times as long as for a wet plate. 4 We cannot tell from your description the cause of the spots in your friend's paper negatives. 5 Half an hour or less is loug enough for the prints to remain in water before toning. 6 Yes, but the results will not be so certainly good.

Y. H. B.—Success in instantaneous photography simply demands that collodion, silver bath, and developer, be in the best condition for sensitiveness, that a good lens be used, and a good light selected. A good bromo-iodized collodion, excited in nitrate batb made from *pure* nitrate of silver, nearly neutral, and iron developer are the best chemical aids. The light must be good, and the lens must not be of a very long focus, uor used with too small a stop. Small pictures are most easily mauaged in instantaneous work.

SMOOTHFACE.—You will find a rolling-press advertised by Mr. Francis in our advertising columns.

HENRY H.—Your negative arrived smashed to a thousand pieces, not one of which was half an inch square. From your description of your difficulties they appear chiefly to arise from the collodion. A cadmium collodion often gives the inequalities of film of which you complain, and unless the bath contain acetate of silver, it is uot always easy to obtain intensity. From what we can see of the fragments of your negative which arrived, it was considerably over-exposed. Try another collodion, giving more density, or add a little acetate of silver to your bath The latter is a plan we never adopt ourselves, however. Use a little more silver with your developer. Do not use a whole plate portrait lens for landscape work without a stop.

G. C. G.—The formula for alabastrine solution is, as we stated last week, a trade secret. There are various modes of producing a similar result. A solution of bichloride of mercury whitens a glass positive, but the tendency is to give a cold bluish tone, whilst the alabastrine solutiou announced by Messrs. Squire and Co., is intended to give a pure blue.

G. C.—Your pictures are scarcely up to the mark yet for exchange with the members of the Stereo Exchange Club. Nos. 1, 2, and 3 are all a little under-exposed. No. 4 is better in this respect, but all the pictures are wanting in sharpness, whether it be the fault of your lens or bad focussing we cannot say. The subjects of your pictures, although probably interesting to yourself from association, have not much value as pictures, and would not, on that account, be acceptable for exchange. You will learn after a little more practice to descriminate better what objects are worthy of selection for their picturesque qualities. The splitting and curling off of the film arises either from bad collodion or imperfectly cleaned plates. We shall be glad to hear of your further progress.

HENRI BELLINI.—Your lengthy communication arrived too late for attention this week. It shall receive our best consideration in our next. We fear it is too long for insertion in its entirety.

C. C. Belgium.—We will write to you privately.

J. L. F.—Your negative is much under-exposed. Double the exposure would probably give you a good picture.

SAMUEL ARTIDGE.—We are obliged by your communication, which shall receive attention in an early number.

SWANSEA.—We are not in possession of further details ou the method of colouring, beyond those given in the paragraph to which you refer. The water glass is a solution of silicate of soda; in what manner it was employed in colouring photographs we do not know. In order to get water colours to take kindly to the surface of albumenized paper, the photograph should be treated with a preparation for the purpose, or a little ox gall mixed with the colour. So far as we can see by examination, the paper you forward may be used for photographic purposes. You need not hesitate to write to us, we shall always have pleasure in hearing from you.

T. K.—The best toning bath is that of alkaline chloride of gold, and it is therefore the cheapest. Chloride of gold 1 grain, bicarbonate of soda 5 grains, water 10 ounces, will tone about 8 whole plate pictures. The gold costs twopence per grain. 2. Add bromide of ammonium in the proportion of about half a grain to each ounce of collodion, aud you may then use it for positives. 3. Toning with platinum is not so efficient or so cheap as toning with gold 4. Hughes' dead black varnish is one of the best we know for backing positives. The price of the vols. of the PHOTOGRAPHIC NEWS which are now in print is 10s. 6d. each

H. B. Y.—To make a good positive collodion, take pyroxyline (not made at a very high temperature) 4 grains; alcohol S. G. 820, 4 drachms; ether 4 drachms, iodide of cadmium 2 grains, iodide of ammonium 2 grains, and bromide of ammonium half-a-grain. 2. Any quiet neutral colour wil do for the interior of a glass room. A drab or dove-colour answers well. The last edition of Mr. Hardwich's Chemistry is the sixth, and is only just out. It is not likely that a seventh edition will be published within a year or two we should think.

Y. A.—Your long letter of enquiries arrived too late for answer iu the present number. It shall receive attention in our next.

X. X.—There are letters awaiting an advertiser who gave this signature last week.

*** Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the NEWS giving the exact reference. Letters intended for the EDITOR should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 140.—*May* 10, 1861.

PHOTOGRAPHY, AND THE INTERNATIONAL EXHIBITION OF 1862.

The photographic community at large were somewhat startled when, some weeks ago, the first rough draft of the classification proposed for adoption in connection with the coming International Exhibition was published, in which photography was placed under the head "machinery," and in the, doubtless highly respectable, company of "ship's tackle," "agricultural implements," &c. Our own first impression of the matter was that it was purely an inadvertency or oversight. It appeared too rich a joke to suppose that the pictures of such men as Bedford and Mudd, Wilson and Fenton, Lyte and Heath, Rejlander and Robinson, Williams, Claudet, and Mayall, and a host of others, could seriously be regarded as rightly classified amongst railway plant, machinery, and tools; and the more so, when we remembered that the royal family of this country were amongst the warmest admirers and patrons of our art.

Knowing, however, that the surest way to render permanent the blunder was to enlist the *amour propre* of its perpetrators in its defence, by a public condemnation of it, and perceiving no readier means of calling the attention of the authorities to its rectification, we resolved to write to Her Majesty's Commissioners, pointing out the error, and the evil influence it must have in preventing a fair representation of our art. Accordingly, a little more than a month ago we forwarded a letter, of which the following is a copy:—

"*April* 11, 1861.

"*To Her Majesty's Commissioners for the Exhibition of* 1862.

"Gentlemen,—Referring to the proposed classification of articles for the International Exhibition next year, will you permit me, as being familiar, from my position, with the views and feelings of the mass of British photographers, amateur and professional, and as, in a non-official sense, representing them, to point out, respectfully, the injustice to them and the art which is involved in placing photography under the classification 'machinery and engineering.'

"It has been the aim, for some time past, of photographers to render their art worthy of consideration amongst the fine arts, and has of late, in portraiture, landscape, and re-productions of paintings, &c., been adjudged by connoisseurs worthy of such consideration. And notwithstanding its importance in connection with engineering, &c., a very large class of the finest photographic productions could not, with propriety, find admission into a class designed for machinery.

"May I respectfully suggest, gentlemen, if the matter be not definitively settled, that photographs be admitted into the department designed for works of Fine Art, and that they may be so classified in any future announcements, as otherwise I fear that many valuable productions of the art will be kept out of the Exhibition.—I am, gentleman, your humble servant, G. Wharton Simpson,

"*Editor of the* Photographic News."

In due course we received the following reply:—

"International Exhibition. 1862.

"Offices, 554, *West Strand London, W.C.*

"16*th April*, 1861.

"Sir,—I have the honour to acknowledge the receipt of your letter of the 13th inst., which will be laid before Her Majesty's Commissioners in due course.—I am, sir, your obedient servant, F. R. Sandford, *Secretary.*

"*G. W. Simpson, Esq.*"

What further attention our suggestion received we are not in a position to state; but as we are not at present aware that any other communication was made to the Commissioners, we may fairly assume that it had some influence in the steps which followed, and which we hope may issue in a satisfactory arrangement, in which the claims of photography shall receive proper acknowledgment.

From an announcement made by the secretary of the Photographic Society on Tuesday night, we learn that a communication from the Commissioners had been addressed a few days ago to the Chief Baron, as President of the Society, suggesting that six or eight persons should be appointed to advise with the Commissioners as to the proper steps to be taken in connection with the representation of photography. A meeting of the council was at once called, when it was very properly resolved that no steps should be taken until photography should be placed in a proper position; classification amongst the works of fine art being claimed as its proper place. The Chief Baron, we understand, then wrote a letter of remonstrance to the Commissioners, arguing the case very pointedly, and conveying the resolution of the Council of the Society. So far as our information goes, the matter thus remains; but we cannot but hope that a wrong so palpable and indefensible, only requires to be pointed out, and the remedy firmly claimed, to receive a satisfactory solution.

We are glad to record that the steps of the council of the society were so prompt and consistent with the dignity of art, when once their attention was aroused by the communication of the Commissioners; although we should have been better pleased to have been able to state that they had taken the initiative in a matter so important, and in which they alone could act with that weight and influence the occasion demanded.

We may here remark that the publication of the official list of the classification intended, whilst it removes the idea that any mistake had been committed in the first published list, still leaves the matter in a somewhat ambiguous state. In Section II., Class 13, we find "Philosophical Instruments, and *Processes* depending upon their use;" and immediately following, Class 14, "Photographic Apparatus and *Photography*," not *Photographs*. From this allocation it would seem that photography as a *process*, and not photographs as works of art, is referred to. Without material alteration in the classification, it is only necessary, therefore, to add "Photographs," to the fourth section—"Modern Fine Arts," to render the classification satisfactory and complete. And as the Attorney-General, in his new Copyright Bill, has essentially defined photographs as "pictures" and works of fine art, Her Majesty's Commissioners can scarcely have much difficulty in following so righteous an example. Now, however, is the time for vigorous remonstrance; and we recommend to the various photographic societies throughout the kingdom, to take consentaneous action, and memorialize the Commissioners, so as to assist the parent society in impressing upon them the extent of the wrong, and the amount of indignation it has excited.

THE TANNIN PROCESS.

It is important that the real grounds of merit in this valuable process should be well understood. It is not a quick process. It is simple in manipulation; and under fair conditions, clean, brilliant, and certain in results,—the negatives having all the qualities which give rich vigorous prints. The difficulty which has troubled many—the tendency of the film to leave the plate—is, we are convinced, to be met without complicating the formula by the coating of gelatine. The use of a moderately adherent collodion, and, more especially, care and skill in the manipulations, will prevent the frequent loss of films. In our own operations with stereoscopic plates, we have found that the whole question of results in this respect was decided by caution or carelessness. We have recently seen a number of negatives by this process, on plates nine inches by seven, taken by Mr. Sutton, in Jersey, in which all the films were perfect, and no difficulty had been found in preserving the result. The chief evil to be guarded against, then, is under-exposure. This has been the fault of most of the negatives we have seen. Those to which we have just referred, although clean, rich, dense, and brilliant, are deficient to our taste, in softness and detail. They appear somewhat under-exposed; notwithstanding that some of them were, we understand, exposed fifteen minutes. We must not be understood, however, as speaking of this as necessarily an evil. If a process be not very rapid, it happens under many circumstances that the next best quality it can possess is to be very slow, as many landscape photographers are well aware. In the tannin process it should be remembered that it is scarcely possible, within reasonable limits, to over-expose, and that full exposure only will give softness and harmony to the negative.

Amongst the very finest results we have seen by this process are some stereoscopic pictures by Mr. Penny of Cheltenham, some of his prints we have seen reminding us much of Mr. Mudd's pictures; in saying this we are according the highest praise we can express. We wrote to Mr. Penny for a few particulars of his manipulation, exposure, and general experience in the process (especially referring to one gem we had seen). We shall here subjoin some extracts from his courteous reply. He says:—

"It will afford me pleasure to give you all the information I can about my working of the tannin process.

"Not having taken it up in an experimental way, my practice has hardly been exact enough to warrant my drawing from it any very certain general conclusions.

"I am, however, able to furnish you with the necessary information about the particular picture referred to. The negative was prepared with Ponting's collodion, excited in a very old bath rather acid, of nearly 40 gr. to oz., thoroughly washed, and tannin solution 15 gr. to oz., floated over it. Exposed early in March, about 9 A.M., in clear sunshine for 5 minutes, developed with pyro $1\frac{1}{2}$ gr. to oz., a small quantity of citro-nitrate being added, cleared with cyanide.

"One 9 by 7 plate I took with a 14in. slow landscape lens, $\frac{1}{2}$in. stop, in 20 minutes, with a very bright light; it turned out all one could desire; but, the fellow prepared in all respects the same, being exposed 5 weeks after preparation, in a *weak* light for half-an-hour, was wooley and wanting in vigour, with transparent sky, &c.; another plate, prepared only 24 hours before exposure, and exposed under the same circumstances of light, gave a similar result, from which I judge the process is not suited for long focus lenses, except with a clear strong light.

"I always expose long enough to get the deepest shadows impressed, otherwise there is danger of getting the picture hard and intense: the light being good there seems little fear of over-exposure.

"A photographic friend and companion of mine, a very careful manipulator, complains of this tendency, if ever so much exposed; mine, on the contrary, have of late been rather too transparent in the skies when fully exposed. It seems that the difference of collodion will account for the different results.

"I have been using lately a collodion of which I can only say, that it is a mixture of remnants both negative and positive, some of them very old; it contains bromide, and is rather alcoholic.

"The film sometimes swells and rises from the plate under development; and I have now and then as a consequence lost a picture from it splitting up when dry. The negatives by this process, in my experience, lose more in fixing, whether by cyanide or hypo, and in varnishing, than any other.

"While experimenting lately upon Fothergill modifications, for which my old collodion mixture seems suitable, it occurred to me to try whether one could safely apply tannin upon a well washed albumen plate, and if so, whether it would not be beneficial by hastening and keeping clean the development of the plate. Also, whether the albumen over the collodion would fix the film, as it does in Fothergill, and so counteract the loosening effects of the tannin.

"The plate was prepared in the following way:—After sensitizing, it was washed in a bath of distilled water, which had been used for some time for washing plates in, and therefore contained a small quantity of nitrate albumen, 1 part to 3 of water was poured over it; after washing thoroughly, the tannin solution was floated over.

"No staining being seen, I exposed the following morning for 6 minutes in bright sunshine.

"It developed certainly cleaner and quicker than ordinary Fothergill; but the film rose on the thicker end, and showed symptoms of cracking on drying. I detail this first experiment, that others may follow it up if so inclined; the specimen is sent for your opinion.

"The negatives were all taken with landscape lenses $4\frac{3}{4}$in. focus $\frac{5}{16}$ diaphragm.

"No 1 is a sample of extreme exposure. No. 2 is from the new hybrid preservative."

The sample of extreme exposure forwarded, is a stereoscopic print, the plate described as exposed at eight o'clock on an April morning, in brilliant sunshine, for twelve minutes, with, we presume, lens and stop described. It is possibly very slightly over-exposed; but is nevertheless a charmingly harmonious print, without the slightest chalkiness, certainly; but still far from being a weak picture. The sky prints through, giving a pleasant atmospheric tint. The highest light are the small reflections on the surface of a pool of water, which being in immediate contiguity to deep shadow of an overhanging bank, which is the darkest part of the photograph, at once gives brilliancy to the whole picture.

The print from the albumino-tannin plate which was exposed eight minutes under the same circumstances as the other, is also a soft harmonious print, but is less brilliant, and shows more signs of over-exposure than the other. The cleanness and rapidity of development described by Mr. Penny give the albumino-tannin process claim to further trial.

PHOTOGRAPHY WITHOUT THE NITRATE BATH AND WITHOUT DEVELOPMENT.

We have received from Mr. H. Bellini a very long communication in reference to some remarks we published a fortnight ago under the above heading. These remarks, Mr. Bellini thinks, are calculated to injure him in his business, and to damage his reputation for veracity, and proceeds to explain the miscarriages which occurred when we called on him six months ago. As these explanations would occupy about a couple of our columns, we should not feel justified in devoting so much of the space belonging to our readers to matters so purely personal. We will, however, without entering into any discussion of the matter, meet the case, so far as Mr. Bellini's feelings are concerned, by assuming that his explanations are quite satisfactory, so far as the occasions to which we referred are concerned. But we must remind him that these miscarriages having occurred, he has taken no steps since, although upwards of half a year has elapsed, to verify the statements in his first letter which we published, and that, therefore, if Captain Dixon or anyone else in the meantime patent any similar discovery, Mr. Bellini has, as we before stated, only himself to blame. So far as we can see, the claims made by Mr. Bellini and by Captain Dixon are in many respects essentially different, and whilst they do not necessarily clash, if the former be justified by practice, the latter would be entirely swallowed up, unless it presented other points of superiority, which results can alone determine.

After making the explanations referred to, Mr. Bellini proceeds to detail the various experiments made in working out his idea. As they show much ingenuity, and traverse a comparatively untrodden field, they will, we think, although somewhat lengthy, prove interesting to our readers. We shall, therefore, although in some of his assumptions we think he is scarcely exact in his chemistry, give them as as they stand. After his personal explanations he proceeds:—

"As I do not wish, and. indeed, never entertained the remotest idea of 'misleading' any one who might place trust and confidence in my statements, I will endeavour as briefly as possible to explain my theory—which is simple enough in practice—together with the method by which I at last carried it out, I contend very successfully, notwithstanding it involves new principles in chemistry hitherto unknown, or but little understood.

"Firstly.—Inasmuch as it is generally supposed, that all substances capable of developing a latent image (by continuing the precipitation of metallic silver, already commenced by the action of light) have also tho property of precipitating silver from all solutions of its soluble salts; that this is not tho caso under certain circumstances I will most distinctly prove.

"Secondly.—That the 'lactate,' or 'milk of silver,' and also the 'chlorato' of silver, are vastly superior to the ordinary nitrate, as these salts yield a much more sensitive surface, and in solution they are not liable to change.

"Thirdly.—That a plato can even be coated and sensitized in the ordinary way, and immediately before exposure may be washed quickly with a very weak pyrogallic, or pyrogallic and silver solution, which will not only render the plate highly sensitive to light, but also cause a partial development of the latent image as soon as tho light begins to act, consequently, upon its removal from the dark slide (in the dark room), it is nearly developed; a picture taken in this way, with a good mixed collodion of a reddish colour, will give most startling life-like pictures, with a very pretty red-lavender background.

"(Commence with a quarter of a grain of pyro acid to the ounce of distilled water.)

"Fourthly.—That it is quite possiblo to combine collodion, silver, and an iron developing solution in one yellow glass bottle, without precipitation taking place, (and yet each shall answer the same purposes as when used separately) providing always that the quantity and quality of the chemicals used are strictly attended to; in this alone lies tho grand secret—the Eureka of photography.

"Fifthly.—That 'white twisted shellac,' with or without the addition of 'gum sandarach,' and prepared in the same way as 'gun-cotton,' can be used to hold the bromide and iodide of silver, for forming a sensitive medium on glass.

"It has long been well known to *savans* and continental chemists that certain silicates, starch, gums, &c., &c., are acted upon in a very pecular manner by different acids, which dissolve them into a thick mucilaginous liquid, precipitated by water, and very soluble in alcohol and sulphuric ether. Shellac prepared in the same way as 'zyloidin' forms a beautiful hard and colourless white varnish. I may here observe, that when some of the silicates and silver sand aro thus treated with different acids, you have the key to the manufacture of 'liquid glass.'

"The idea having frequently occurred to me, that it might be possible to incorporate the sensitivo bath with the collodion, I determined to make a few trials for the following reasons; namely. very few samples of alcohol are pure, or what is called 'absolute' or 'anhydrous,' consequently there is generally sufficient water in an ounce to dissolve from 30 to 60 grains of nitrate of silver in the course of forty-eight hours, and thus absord all the water, leaving the spirit perfectly pure: we will, for the purposes of argument assume that 30 grains is the utmost quantity of silver an ounce of alcohol will dissolve (the tbe usual working strength of a silver bath); we now proceed iodize it, according to fancy, with any of the soluble salts, I prefer the iodide and bromide of silver, which I myself specially prepare for this purpose, the usual quantity to the ounce, this being again dissolved you will obtain a very sensitive fluid, of a bright yellow colour, with the nitrate of silver in excess of the iodide, this is, of course, absolutely necessary.

"Now we want the developing agent, and I add, very cautiously and gradually, for that purpose, a few drops of a tincture of iodide of iron, till the proper result is obtained, and which renders it so extremely sensitive to light that the action is almost instantaneous, a portion of protonitrate of iron being thus formed within the film itself, it now requres to bo briskly shaken for ten minutes, and then allowed to settle for twenty-four hours beforo use, it must also particularly bo kept in a stoppered yellow glass bottle.

"Supposing it now to be ready for use, we proceed to coat a plate and expose it in the camera, on its removal from the dark slide, in the dark room, and on holding it up to the yellow, or red glass light for a few seconds, we perceive that the latent image is gradually but surely developing itself, in fact, it must either be placed next in water, or a weak solution of cyanide of potassium to stop this most extraordinory self-development. and afterwards finally washed and allowed to dry spontanoously in a vertical position, with the film side to the wall.

"If tho fluid is 'curdy,'—which is never tho case, unless water is present—(this is generally the case when insufficient silver has been added to absorb all the water), filtering in the dark through a double piece of white silk, and tho addition of more silver are the only remedies I am acquainted with, that will effectually clear the preparation and render it fit for use.

"I have also tried tho addition of a minute proportion of pure white pyrogallic acid to tho above (omitting the iodide of iron), with the view of forming a sort of 'tannato of silver' in the film; but on the plate being exposed in tho camera, a very curious phenomenon ensued. The image turned of slaty-violet hue, and on trying to render the latent image apparent by forcing it with an ordinary developing solution, it turned an opaque deep black. (The exposure too was rather long).

"These were, you must most distinctly understand, only a few of my first attempts to achievo the end I had in view; and my partial success induced me to make fresh trials with other materials, but I sadly felt tho want of some friendly practical chemist's advice, or the opinion of some master mind at different stages of my experiments; but the fear of failure, and the ridicule which I knew, from bitter experience, would be inevitably attendant thereon, deterred me from seeking any, save what I could glean from reading all the best works on chemistry. I feel convinced, that if I had received a little assistance of the above description (my natural intuitiveness of perception having already solved the problem), the public would have been working tho invention long ero this.

"It seemed, from the appearanco of the plates, to want only a very little something; but bearing in mind the good old proverb that 'patience and perseveranco frequently overcome the greatest difficulties,' I essayed a final attempt with totally different materials, which in the end proved successful.

"I next dissolved half-an-ounce of the best white twisted shellac and a quarter of an ounco of gum sandarach, in one ounce and a half of pure alcohol, and proceeded as before—the result was a veiled and rather indistinct picture, spoiled, without doubt by a hard, horny, cellular, network film, which, while it formed a coherent film on tho glass, and stood admirably the effects of a strong solution of cyanide of potassium, had nevertheless a very harsh and unpleasant appearance—a common developer even being unable to penetrate the hard film. I, notwithstanding this very great drawback, felt elated and encouraged to proceed.

"I next treated tho white twisted shellac in the same way as 'zyloidin,' and gun-cotton with nitric, and nitric and sulphuric acids, soaking it afterwards well in distilled water, then again in ditto with a little ammonia in it, and finally well washing. It had now a white, soft, waxy, mucilaginous, parchementy appearance (it was of course explosive when dry).

"When I judged the water was all absorbed by the dryness of the atmosphere from tho shellac, I added half-an-ounce of it to one ounce of pure alcohol (omitting the gum sandarach), I tried sensitizing this with every description of the salts of silver, but succeeded best with the 'chlorate' and 'lactate,' or 'milk of silver' prepared by myself specially for this purpose. I have also sometimes found it beneficial to render the solution at times slightly acid or sour with glacial acetic acid, or lemon-juice. The ether is added in tho usual proportions.

"Having iodized it with any of the usual salts (iodide and bromide of silver are best), and also tested it to see whether it will yield a picture with an ordinary developer—you next proceed to add the developer slowly.

"The Developing Agent.—Tincture of pure iodide of iron must only be added very gradually after the other ingredients are all dissolved, shaking the bottle well and trying a plate between the addition of every few drops until you have ascertained pretty nearly the quantity it will be necessary in future to add.

"Note.—The exposure, and action of the light on these very sensitive plates is almost instantaneous; but the latent image is not visible for a few seconds afterwards.

"The iodized collodion film, thus prepared being much superior to a collodion film, more 'pre-sensitive' and tenacious, independent of the astonishing delicacy and the extreme minuteness of the general detail, combined with great solidity, purity of the whites, and blacks, &c.

"I superimposed a negative on one of these plates (which I know will remain moist and sensitive for a long time), and it gave a fair print.

One very great object is attained by the use of my collodion, namely, that you can prepare the day before you intend to 'fire them off' as many of these plates as you may think proper; they will keep moist and retain their sensitiveness if preserved carefully from the light; this surely is worth our best attention.

"I shall have it ready for sale next month; all I ask is a fair field and no favour, and that you will not condemn or prejudge a long stride in the right direction in consequence of a partial failure, over which I certainly had but small control.

I was perhaps somewhat premature in making the announcement so soon, or till the preparation was ready for immediate use, but I wished the extraordinary fact to be published, partly to secure my just claim to being the sole inventor of the process ('mind being property, as well as matter,' in my opinion), and I also wished as soon as possible to lessen the labour and time usually occupied in rendering the glass plate sensitive.

"Shellac dissolved in spirits of wine, has been used also to preserve the stone, and prevent the further decay of the Houses of Parliament, and the result proves that it was admirably successful, where protected from rain.

"Acting on a hint given by a very clever friend of mine, that 'turmeric' could be employed to increase the density of all negative collodions, I have found that a drop or two of a filtered and very weak 'tincture of turmeric' added carefully, will in truth produce any required degree of intensity, the lights being in that best of all conditions, semi-transparent, thus yielding clear, round, soft, and very solid prints.

"Apologizing for the necessary length of this reply, and the detailed instructions.—I am, sir, very respectfully yours,

"Henry Bellini."

We once more repeat that Mr. Bellini's position is a very simple one. He has merely to verify his statements by practical results, and he may depend upon it that honour and profit await him, and he will not, we think, have anything to fear in the shape of injustice from any part of the photographic press. In regard to his latter remark as to turmeric, he may possibly not be aware that it was proposed for the purpose indicated sometime ago by Dr. Mann Sanders.

In another column will be found a letter from Mr. Smith, of Bath, detailing some experiments in a similar direction. M. Poitevin published a process last summer in which nitrate of silver was added to collodion, but excited subsequently by pouring over the film a solution of iodide of potassium. The details will be found in our third volume and in Photographic News Almanac.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulteration, and Analysis.

Chloride of Silver is decomposed by a great variety of agents; of these the chemical action of light is one which is most familiar, although this kind of decomposition, by this agent is apparently enjoyed only by the chloride which is prepared in the wet way (i.e. by double decomposition between silver solution and a soluble chloride). Some curious experiments have been recorded on this subject by Dr. Percy. This chemist has shown that when chloride of silver has been prepared by the direct union of metallic silver and chlorine gas, it undergoes no darkening whatever, even when fully exposed to sunlight, a specimen having been kept for some months fully exposed to light in common air without any darkening whatever taking place. The decomposing power of light on the ordinary precipitated chloride of silver is likewise capable of being modified in several ways. Amongst the most remarkable may be mentioned the following instance which is likewise due to the experimental skill of Dr. Percy. Some chloride of silver was placed in a small glass tube, chlorine gas was then introduced, and the tube closed. When the instrument was exposed to the light a certain degree of darkening took place within a given time; and when removed to the dark the chloride of silver assumed its original whiteness, gaining at the same time its sensitiveness to light. The above experiments point to a radical difference in the molecular constitution of chloride of silver prepared in different manners, for whereas chloride of silver prepared by the direct combination of its elements refuses to darken in the sunshine even when in the ordinary atmosphere the precipitated chloride is darkened when surrounded by chlorine. The last mentioned property of chloride of silver was suggested by Dr. Percy as a ready means of making an instrument for measuring the amount of chemical energy present in light. A series of tubes were to be arranged side by side. These being each charged with chloride of silver and sealed up containing an atmosphere of chlorine were to be exposed to the light each for a different number of minutes. Upon examining which tube had darkened to a certain standard degree of darkness, the negative photographic value of the light could be at once seen. Amongst the other decompositions of chloride of silver which may interest the photographer may be mentioned the following: alkaline sulphates in solution readily reduce it when freshly precipitated to the metallic state on boiling; the resulting metal may be obtained quite pure by washing it in ammonia. The following metals, especially in the presence of a little free acid, and aided by heat, reduce it to the metallic state:—Arsenic, antimony, bismuth, zinc, cadmium, tin, lead, iron, copper, and mercury. A solution of caustic potassa of a specific gravity of not less than 1·25 decomposes recently precipitated chloride of silver with production of the olive-coloured powder of oxide of silver. Chloride of silver dissolves in small quantity in concentrated hydrochloric acid, in solution of chloride of ammonium, and various metallic chlorides, and in strong nitrate of silver solution, from these it is for the most part precipitated upon dilution; it is also rather soluble in nitrate of the peroxide of mercury. Its true solvents are, however, ammonia and hyposulphite of soda, with the latter it forms chloride of sodium and a double hyposulphite of soda and silver.

Chloride of Mercury.—There are two salts of these elements. One, the subchloride or calomel, and the other the perchloride, or *corrosive sublimate*; the latter is the only salt of interest to photographers. Corrosive sublimate is not an easy salt for amateurs to make; perhaps the following is the method most likely to be useful. Grind together in a mortar 1 parts of mercury with 1 of common salt, 2 of nitre, and 4 of calcined green vitriol till the mercury has lost its fluidity, and then sublime in a glass retort. White fumes condensing to a white crust are evolved, and when these have ceased to come over and condense in the neck of the retort, they are to be scraped out and dissolved in water. The filtered solution evaporated to the crystallizing point, deposits corrosive sublimate which may be rendered quite pure by crystallization from alcohol. Thus purified it forms white tabular crystals, which when heated fuse, boil and volatilize below redness. According to Faraday corrosive sublimate evaporates even at the common temperature, but this statement is contradicted by Riegel. Its aqueous solution is acid to test paper; it has a sharp metallic taste, and is very poisonous. Exposed in solution to sunshine it is decomposed with precipitation of calomel. Several metals likewise decompose it with precipitation of either the subchloride or metallic mercury; such as arsenic, antimony, bismuth, zinc, tin, lead, iron, nickel, copper, cadmium, and silver. Corrosive sublimate dissolves in 16½ parts of water at 14° C. and in 2 or 3 parts of boiling water. It dissolves in three parts of alcohol, in 4 of ether, and abundantly in volatile oils.

Perchloride of Gold.—This important chemical may be prepared in the following way:—Pour over half a sovereign, placed in a clean glass flask, a mixture of two parts strong hydrochloric acid and one part nitric acid, and warm gently in the water bath; energetic action will at once take place, and the coin will speedily be dissolved; if the first quantity of acid which is poured over is not sufficient for this purpose more must be added. When the coin has entirely disappeared evaporate it very gently in a dish over a water bath until the solution is of a syrupy consistency; then remove and dilute considerably with water. If any white precipitate take place at this stage it will be chloride of silver and must be filtered off. Now add to the clear liquid an excess of solution of protosulphate of iron and gently heat; all the gold will be then precipitated in the form of a brown powder free from copper. This must be filtered, washed first with warm dilute hydrochloric acid, and then with distilled water. The pure gold produced in this manner must then be dissolved in nitrohydrochloric acid in the manner described above, and the solution evaporated in a water bath with excess of hydrochloric acid to a syrupy consistency, but not too far or it will be decomposed into the protochloride. It may then be dissolved in water and preserved for use. A half sovereign, containing about 56 grains of pure gold will yield about 86 grains of pure terchloride of gold, and thus if no loss has been experienced in the manipulation the strength of the solution can be readily estimated. It will be convenient to dilute it until one drachm of solution contains one grain of anhydrous terchloride of gold $Au\,Cl_3$. The solution so obtained is of a magnificent yellow colour inclining to orange; it tastes rough and bitter, but not metallic, and under the influence of light stains the skin and organic matter in general a purple red colour. Most metals, including silver and platinum, precipitate the gold from it in the metallic state; many organic compounds likewise reduce it. Oxalic acid throws down all the gold as a metallic brown powder with evolution of carbonic acid; a very dilute solution is coloured purple by transmitted light. Protosulphate of iron precipitates the metal in the form of a red brown powder which colours the liquid blue by transmitted light and brown by reflected light. This is a very delicate reaction, a solution of no more than 1 part of gold in 64,000 parts of water being capable of recognition by its means. Hyposulphite of soda added to an excess of gold solution precipitates sulphide of gold; if, however, the gold solution be added to an excess of hyposulphite of soda it dissolves with formation of a double salt.

ON PRINTING TRANSPARENCIES.

BY SAMUEL FRY.*

I now come to the gelatine method. Make a solution of

Wilson's Gelatine ...	30 grains
Water ...	10 ounces

The same arrangements of baths made here as for the albumen process, but with 3 of necessity, viz.: 1 for nitrate bath, one for distilled water, and the third containing the solution of gelatine.

Proceed exactly as previously described for the albumen, until completing the thorough washing after the distilled bath. Then immerse the plate in the solution of gelatine, and allow it to remain one minute. On removing, set up to drain corner-ways without washing off the gelatine.

When surface dry, finish up by artificial heat. The solution of gelatine of the strength above described, will almost set into a jelly when cold, and may be liquefied by slight warmth for use.

In the previous use of gelatine for dry plates for the camera, it has been recommended, I believe by Mr. Long, to add citric acid to the solution; this has, I believe, a certain effect in preserving the whites of the picture, and also has a tendency to prevent discoloration of the developing solution, but I have of late omitted its use on account of the retarding influence it exerts, thus leading to considerable loss of time.

With regard to the Oxymel preparation, I use that as before described, of the strength of 1 dram to 4 ounces of distilled water, and applied in the same manner as the gelatine. The same bath of gelatine and oxymel may be used for about three dozen plates.

Our plates are now ready for exposing, and to effect this properly, a small printing frame the exact size of the plates should be employed, though not indispensable.

In larger frames the negative or prepared plate may be scratched from slipping about on the smooth surface of the glass. The front glass of the frame should be very carefully wiped and dusted out, and the surface inside and out polished, as smears are often represented on the surface of the pictures, when printed, through their being imperfectly cleaned. In a yellow light place the negative inside the frame, picture side uppermost, lay the prepared plate on it very gently, and endeavour at once to put it in its exact position, and not allow it to slide about on the surface.

Over the prepared plate put a padding of felt, and then fasten the lid firmly down. This done, carry the frame and expose it to a north light: for a weak negative, 5 seconds is ample; one trial will generally suffice to indicate what the true exposure should be.

To develope, remove the plate very carefully from the frame, and immerse it in a bath of distilled water. For the oxymel process it suffices to merely wet the surface of the plate; but the albumen plates should soak for two minutes, and the gelatine for five: the developers I use are,

For albumen and gelatine:—

Pyro ...	1 grain
Citric acid ...	½ grain
Water ...	1 ounce

For oxymel plates:—

Pyro ...	½ grain
Citric acid ...	½ grain
Water ...	1 ounce

also make for use during development a 20-grain solution of nitrate of silver, and use it for no other purpose. We must bear in mind that the plate having been deprived of all but an homœopathic trace of its free nitrate, more must be added, and acting with the developer before any image can be produced.

To develope, take 2 drams of the solution, and 6 drops of silver, pour it quickly over every part of the already wetted surface of the plate, and move it well from one side to another. The oxymel plates begin to develope the instant the solution is on, and are rarely more than a minute before complete.

There are few of the difficulties of negative development about the process we are now performing. The eye can observe each accumulation of density, and can apprehend the exact moment when the application of water should arrest it. Though the albumen and gelatine plates occupy rather more time in development than the oxymel, I do not look upon it as any drawback to their usefulness. On the contrary, ample time is allowed to judge when sufficient density is acquired.

Those pictures should be essentially transparencies, even

* Continued from p. 218.

the deepest shades should be semi-transparent, and the whites clear and unclouded.

The effects of under and over-exposure are more easily observable than in a negative, the former giving a black-and-white patchy image, and the latter a hazy, cloudy affair, very dim and indistinct, coming up far too quickly under the developer, whilst the under-exposed plate, for a long time, shows no result whatever; and, after giving more trouble and using more developer than half-a-dozen good plates, is useless. The tendency is to over-expose, and, for that reason, I am partial to exposing the plates in an ordinary room, at about a yard inside a shady window, where a definite exposure of, say 30″, is required. Where the time is here once nicely hit upon, a considerable number of pictures may be obtained in a short time.

I have sometimes found, in winter time, the citric acid in the developer had a powerful retarding action, and have then substituted acetic acid, but not frequently. I invariably use cyanide of potassium for fixing, but recommend a weak solution, such as will require two minutes to dissolve the iodide.

When thoroughly washed, set up to dry, preparatory to the next operation, which is that of scraping away the film at each end and round the sides of the plate.

This operation gives a very pleasing finish to the pictures after mounting, and is in every way to be preferred to the plan adopted by some of putting a black paper mount between the transparency and ground-glass. In order to be able to rule lines mathematically straight down the ends and sides of the transparency, it is indispensable to fix the plate firmly with the film uppermost. This is best done by fastening wire pins into a board of eight inches square, in such a manner that they may project above the board one-eighth of an inch, and allow a stereoscopic plate to be dropped between them. The ruler I recommend is a straight piece of boxwood, nine inches long and two inches wide, having at each end a slip of wood one-eighth thick and one inch square glued on. This ruler may be moved over the stereo. plate without touching the film.

With this ruler, and a very fine bradawl, or any pointed tool, draw lines along the film three-eighths of an inch from each other, and three-sixteenths from each side, along the entire length. With a knife, or pair of scissors, carefully scrape off all the film outside these lines.

Some pictures require a line ruled down the centre, but this is not invariably the case. Be very careful to remove, with a soft broad camel-hair brush, any particles of dust; then pour over the picture a thin, transparent varnish, of such as used for collodion positives—it cannot be too thin, or too free from specks. It should always be filtered after use, as the smallest hair, or piece of floating matter from the atmosphere, is detected on these pictures.

And now with regard to the mounting and finishing our picture. Two methods are available. The first is to simply bind a fine greyed glass over the picture, the rough side next the film. This beautiful plan is so well known, that it would be waste of words to describe its appearance; but the second means is intended for those who are in places where these finely-ground glasses cannot be obtained, and consists in adding to any good crystal varnish about sixty grains per oz. of white wax. When this mixture is poured into a cold, thin stereoscopic glass, it quickly sets, and forms as good a medium as can be desired to show up the transparency. It is placed waxed side inwards, and bound round with a thin ribbon of dark-coloured paper. The appearance, I believe I may say, is quite equal to the ground-glass, and much less expensive.

The utmost care is necessary to pour the wax varnish on the surface very smoothly, as any waves are very distinct in the stereoscope.

The ribbons of paper to bind the pictures together should be three-eighths of an inch wide, and of a length to go quite round the picture at one operation.

The best material for sticking them on, I find, is glue, as it sets firmly at once, and is air-tight to a greater extent than paste, or most cements. I have given every branch in tolerably full detail, because I well know the difficulties that beset beginners, and, in conclusion, cannot too strongly recommend the readers of the News to try one or all of these very simple processes, which produce exquisite pictures, and are most simple of practice.

Proceedings of Societies.

The London Photographic Society.

The usual monthly meeting was held on Tuesday evening, the 7th instant, at King's College; Mr. Henry White in the chair.

Captain Willoughby Osborne, H. Hailstone, Esq., and Col. Maitland were elected members of the society.

The Secretary read a letter from Mr. Lazarus, Secretary of the Bengal Photographic Society, remitting the sum of one hundred pounds collected in India in aid of the Archer Fund.

Mr. Thomas then read a paper entitled, "How to prevent Stains and Streaks in the Negative." Passing over a variety of easily traceable causes of stains, &c., such as damp or dirty clothes for polishing the glasses, he expressed his conviction that the most prevalent cause was too much light in the dark room. Photographers were, he observed, in the habit of working at the present day with their dark rooms admitting as much yellow light as they did several years ago, forgetful of the increased sensitiveness in which improved preparations communicated to their excited plates. Streaks in the direction of the dip were, he said, caused by the plate being lifted out of the bath, and exposed to the excess of yellow light, whilst the bath solution was standing on the plate in greasy lines, and the action of light on the plate in that condition produced these lines. Nine-tenths of the failures which occurred he attributed to this cause. He then detailed some experiments, and produced the negatives which, he conceived, illustrated his position. He concluded by stating his conviction, that a proper over-hauling of the dark room, in order to take every precaution against the presence of actinic light, would prove an effectual remedy for the majority of troubles arising from this cause. No kind of yellow or orange glass, he believed, was sufficient alone to prevent actinic action.

Mr. Bedford, in reply to an appeal from the Chairman for his opinion said, that he worked with so much light in his dark room, and yet got satisfactory results, that he felt unwilling to make any remark on the subject. He certainly could not entirely go with Mr. Thomas in regarding this as such a fertile source of failure. It was undoubtedly essential to take every precaution to avoid the presence of diffused white light; but he thought a sufficient amount of yellow light was desirable. Had Mr. Thomas ever developed a plate without any further exposure than that to which it was submitted in the dark room to see if it produced streaks? He remembered that some of the most brilliant negatives he ever produced were taken at Marlborough House, on plates 8 by 5, and he there only used two thicknesses of yellow calico over the window. He there had sufficient yellow light to read the smallest print in any part of the room, and yet the negatives did not fog, streak, or stain. When he had been troubled with those streaks, he had tried darkening the room with additional yellow calico; but, although it made the room very inconvenient to work in, it did not remove the streaks. He did not think Mr. Thomas had indicated the true cause.

Mr. Vernon Heath asked what aspect the window had at Marlborough House to which Mr. Bedford had referred.

Mr. Bedford: Nearly south.

Mr. Heath thought it was due to Mr. Thomas to mention his experience during the last few weeks. He had been much troubled, whilst working in his glasshouse in London, with stains, and Mr. Thomas had pointed out the cause as being too much light in the dark room, although it was lighted with ordinary care. He had altered it according to Mr. Thomas's suggestion. The streaks at once disappeared, and he obtained brilliant negatives, with printing qualities to which others he had obtained in the room bore no comparison. The streaks ran from the top to the bottom of the plate, and he found they could be produced at will by the action of light.

Mr. T. R. Williams, in answer to the chairman, remarked, that whilst streaks might undoubtedly be caused in that way, he did not think it was the common or ordinary cause.

Mr. Malone said he remembered that Mr. Crookes, in fitting up his dark room, placed a sheet of yellow glass in the shutter, put an excited plate opposite to it in full sunshine, and then developed it. By this means he at once was enabled to detect the slightest photogenic action. When the dark room at the London Institution was being fitted, Mr. Bedford, he remembered, had suggested the use of yellow calico as well as yellow glass in a case where the glazier had not put in the deep tint of yellow which had been selected. It was important to conduct operations in a systematic manner in testing for the presence of actinic light, as it was quite possible to have the room so dark as to be impossible to work in it, and yet not be entirely free from the presence of actinic light. It was well known that a dirty plate would sometimes cause reduction without the action of light, and it was quite reasonable to suppose that the slightest dirtiness of the plate, not sufficient to cause reduction and stains in itself, might, by the presence of a very small amount of diffused actinic light, be assisted to set up an action, and thus cause stains. The mode in which the streaks referred to were caused by the action of diffused light, was, he presumed, due to the greasy lines present when the film was first lifted out of the bath, refracting the light, and thus producing increased action just in those parts,

Mr. Sebastian Davis thought that the action of light was by no means always the cause of these streaks. He had recently been preparing some dry plates, and for economy of time had two baths in use. One of these gave streaks, whilst the other did not; the former being a very old bath having excess of ether. He used orange glass and a covering of yellow paper. He thought it important to have a means of regulating the amount of light for bright and dull days.

Mr. Malone remarked that the yellow flashing did not always perfectly cover the glass, and it might be desirable then to use two thicknesses, or calico as well. It was possible that the streaks occurred from light only, when the plate was in the highest possible state of sensitiveness.

Mr. F. G. Eliot said the lines occurred sometimes when there were no fogging tendencies. If the plate were lifted out of the bath at an early stage, and kept out long, streaks would occur, which would be prevented if it were moved up and down quickly, notwithstanding that the aggregate amount of time which the plate would be out of the bath was equal to that which would have produced stains if kept out at one time. This appeared to contradict the idea that it was caused by light. There was always less danger of the streaks with a collodion containing a full proportion of alcohol.

Mr. Thomas, referring to Mr. Bedford's statement regarding his operating at Marlborough House, remarked that he believed that this was some six or seven years ago, and that the nitrate of silver then used contained much nitric acid; the collodion was chiefly iodized with potassium; and the pyroxline then used was of that quality which soon decomposed, so that everything at that time was in a less sensitive condition than at the present time, and that now, therefore, additional precautions were necessary. In reference to the use of orange, or yellow glass, he could not allow that it was ever sufficient to protect sensitive wet plates from the action of light. He had not had much experience in dry collodion, and for his own part he wished all dry collodion processes were at the bottom of the sea, because they had superseded the most beautiful dry process in his opinion, the calotype paper process, the results of which were superior to anything produced by dry collodion plates that he had ever seen.

Mr. Malone protested against the assumption that orange glass might not be procured, which would entirely intercept actinic light, if not always in one thickness, at least in two. Mr. Crookes' experiment was conclusive on that subject, and he was too good a chemist to use a nitrate bath containing nitric acid in such an experiment; if that were the assumption which was to meet Mr. Bedford's experience. Mr. Thomas of course could speak definitely in that case, as he had sold Mr. Bedford the nitrate of silver containing this free acid.

Mr. Thomas would be very glad to meet with the yellow glass which would thus stop out actinic light, as he had been unable to procure any.

Dr. Diamond said that yellow glass might be used for such a purpose, there could be no doubt, as it was in Archer's camera, without any fogging whatever. As for the streaks referred to, he had never met with them in his own practice.

Mr. Sutton remarked that he had used a vignetting plate of red glass in printing transparencies, and no action of light was observed under the red glass.

Mr. Harvey then read a paper on ancient and modern methods of preserving works of art, of which an abstract will appear in our next. The paper was illustrated by several handsome portfolios made on Mr. Harvey's patent.

Mr. Vernon Heath gave notice that at the next meeting he would bring under the notice of the society the anomalous position in which photography was proposed to be placed in the Exhibition of 1862.

Dr. Diamond stated that the Chief Baron had received a communication from the Commissioners requesting the Photographic Society to appoint six or eight persons to advise with them regarding arrangements for the representation of photography. A meeting of the Council was at once called, and it was resolved that photography ought to be placed in its right position before photographers could take any part in the matter. The Chief Baron had, therefore, written a remonstrance to the Commissioners, which he hoped would have the effect of bringing about the desired result.

Mr. Heath thought that this was highly satisfactory. When he first saw the announcement of the classification he thought it must have been a mistake, as photography could never be intended to rank as a simple mechanical operation. How was it there was such a striking individuality in the productions of different photographers? The distinctive styles of men like Bedford, and Fenton, and Lyte, were just as distinctly marked as those of the masters in painting. This distinctiveness, as artistic excellence, was alone surely enough to prove the right of photography to a place amongst the skilled arts, and rescue it from being regarded as purely mechanical.

Mr. Shadbolt suggested that if photography were not properly placed in the Exhibition of 1862, photographers should not exhibit there, but that a contemporaneous Photographic Exhibition should be got up, disassociated from that undertaking. He might mention that a correspondent of the British Journal had suggested that it would be well if the space could be so arranged as to allow of the works of different societies being kept together, so as to secure the emulation of societies as well as of individuals.

Mr. Malone stated some of his personal experiences in connection with the Exhibition of 1851, having been appointed at the last moment on a sub-committee to attend to the matter; and he well remembered the hostility of feeling then manifested to any consideration of photographs as works of art. Some specimens arrived late which were coloured, and the photographer who had sent them contrived to get them into the fine art department. He (Mr. Malone) pointed out the anomaly, and simply received for answer that the photographer who had sent them was a noisy troublesome fellow, and they had better remain where they were. He feared a similar spirit was likely to prevail in regard to the Exhibition of 1862.

Mr. Durham said, that the suggestion of the council was that photography be removed from the class devoted to the mechanical arts to that devoted to fine arts.

Mr. S. Davis thought that touched photographs ought not to be admitted, as the very fact of touching gave countenance to the idea that photographs were not sufficiently perfect as works of art without the aid of the pencil.

Mr. V. Heath said, that he hoped to be able to exhibit Professor Way's Electric Lamp at the next meeting.

The proceedings then terminated.

Newcastle Photographic Society.

The monthly meeting of this Society, held on Friday evening the 4th inst., in the Carpenters' Tower, was a highly interesting one, and was crowded to excess. Mr. J. C. Warren, one of the vice-presidents, presided.

The Chairman read a circular he had received from the hon. secretary of the Birmingham Photographic Society, notifying that they intended holding an exhibition of photographic pictures, and offer silver and bronze medals for the best specimens in the various departments of the art, towards the end of the present month.

The meeting then proceeded to the trial of a number of experiments with the Photogen, the invention of Mr. Moule, by the aid of which several portraits were taken in the room—Messrs. Laws and Warren, of Newcastle, and Mr. Hill, of North Shields, assisted by Mr. North and Mr. Porteus, operated.

In a letter which accompanied the apparatus, Mr. Moule informed the secretary that he had sent out to Bengal, by order of the Government, two of these lights and apparatus complete, to be used for the purpose of taking the interiors of caverns in India, which can only be done by means of artificial light. He also stated, that during the last season no less than 300,000 portraits had been taken by artifical light, and that portraits by the photogen were becoming general in London.

The Chairman also exhibited, explained, and manipulated with the pistolgraph—an ingenious little instrument for taking portraits—so small, indeed, that a box 3 inches by 2½ inches would contain it. The experiments were entirely successful.

The utmost satisfaction was expressed with the portraits and transparencies exhibited, the result of the experiments by the council, a conviction being expressed by many that portraits taken by the aid of the photogen were equal to any taken by daylight.

A resolution was passed expressive of the high opinion entertained of the photogen by the society, and intimating their conviction that the testimonials, &c., given to Mr. Moule were well deserved. Also, that portraits taken by the aid of the photogen were equal in tone, strength, and delicate shade to those by sunlight. A vote of thanks was also given to Mr. Moule for the readiness with which he forwarded the photogen for exhibition to the society on learning the council's wish.

Mr. Law's paper on transparencies was postponed by desire of the council, in consequence of the receipt of the photogen.

Votes of thanks to the Chairman for presiding at the meeting, and to the operators for their interesting experiments, concluded the proceedings.

The exhibition of the photogen produced considerable excitement, outside as well as inside the meeting, many hundreds of persons being attracted by the light.

[Mr. McKie, the honorary secretary, has forwarded us a print of one of the half-plate negatives taken in the meeting by means of the photogen; a portrait of one of the reporters on the *Newcastle Daily Express*. It is in no respect inferior to many photographs taken by the solar light with all "appliances and means to boot."—Ed.]

Critical Notices.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY FAMILIARY EXPLAINED; Embracing the Collodion Process; Printing on Plain and Albumenized Paper; How to produce Life-size Portraits; Dry Plate Photography; Colouring and Mounting Photographs; Defects, Failures, and Remedies, &c., &c. By C. Jabez Hughes: London, 379, Oxford Street.

There are few things so difficult to accomplish as to write a good elementary book, which shall not be *only* an elementary book; to give the most simple instructions in the most familiar and popular manner, and yet convey information for constant reference, of abiding value to the expert, as well as to the enquirer on the threshold of science. It is not only necessary that the author shall understand his subject intimately, having pursued it through every phase of circumstance, but that he shall also have the gift of teaching; that he shall have the happy art of investing the recondite and abstruse parts of his subject with the familiar aspect which makes them seem easy; and so deal with those things, which, from their apparent simplicity and common-place character, are apt to be overlooked, that they assume an uncommon face, and so gain the attention which their real importance demands. Amongst the multitude of manuals of photography which the actual demand, the *cacœthes scribendi*, and trade exigencies have brought into existence, and amongst which there are already good, bad, and indifferent guides, we know of none superior to the little work before us. Possessing all the qualities of most other first books, it also has some distinctive features peculiarly its own. The style in which it is written is pre-eminently a happy one. The instructions are addressed to a pupil supposed to be present, and the easy, familiar, and colloquial style of addressing a definite personality is adopted. This is, however, never allowed to run into digression or discursiveness. The air of a thorough master, too much in love with his art to run away from it, is manifested throughout.

A chapter on the use of diaphragms or stops is the most complete on this important subject we have seen published; in too many works the subject is passed over with merely a passing allusion. The chapter devoted to copying and enlarging is also very complete, and will prove a valuable guide to others besides the mere beginner. "How to arrange the lenses in a portrait combination" is the heading of a chapter which will place the photographer in possession of information at once which will prevent him troubling the optician or dealer, by complaints of a bad lens, simply because he has unconsciously contrived to misplace some lens in the combination. The student of dry photography will find very complete epitomes of the collodio-albumen, the Fothergill, and the tannin processes.

The chapter on "Defects, Failures, and Remedies" will be of interest and value to every reader and will be one of the first referred to by all who have had any experience. It is one of the most complete and comprehensive chapters ever published on the subject, not less than twelve pages being devoted to the extrication from this inevitable photographic "hill difficulty." The opening paragraphs in this chapter are so much to the purpose, and are so characteristic of the excellent style in which the book is written, that we will quote them here:—

"However it may be in other mortals, for a certainty, 'tis not in photographers to command success; and although I have given you clear and simple directions, which I have no doubt you will carefully follow, yet, My Worthy Pupil, I fear that you will not be exempt from many of those troubles which most of us have encountered.

"It may be a melancholy satisfaction to know that the cleverest practitioners are subject to them in common with the less skilful; the difference, however, being, that the former by perseverance overcome them, while the latter give up the contest and are beaten.

"As you have, no doubt, determined to belong to the first class, and with a view to aid you, I enumerate the most probable causes of failure.

"Generally speaking, to point out the origin of a defect is also to suggest a remedy; when, however, this is not evident it will be stated. It is impossible to anticipate where your difficulties will be, for the experience of no two exactly agrees, but you must endeavour to *understand* the process, and to grasp the *spirit* of the directions. Above all things resolve to be neat and clean in your manipulations, cool in your manner, and exercise an observing eye, and you will certainly escape from nine out of ten of the beginner's troubles.

"Whether a person shall succeed or fail in photography depends very much on the spirit with which he commences. If he thinks the whole process a *mechanical* one, mainly a question of apparatus, baths, and developers, he has no pleasant future. When he gets into difficulty—and he soon does—he declares his chemicals are wrong, his bath is out of order, is camera is bewitched, and rushes from shop to shop to buy the last 'patent never-fail collodion,' or the marvellous greek-named lens that takes pictures in a few seconds less than no time, or some other be-puffed and be-advertised nostrum, instead of stopping at home and quietly finding out in what his trouble consisted. Possibly he has mixed his plain collodion and iodizing solution in reversed proportions, or strengthened his nitrate bath out of the unlabelled hypo bottle, or been trying to develope with his cyanide. Such a man soon wears himself out, declares, 'it's no use trying, it's all chance,' and attributes the success of skilful men to the use of 'secret dodges.'

"As a contrast, observe another man, who begins quietly and steadily, and, getting into trouble, thinks it very probable that it is *he*, not the chemicals, that is wrong; and instead of throwing them down the sink, perseveringly proceeds, finally discovering that the same chemicals that gave him bad pictures now furnish good ones, the difference being only *in the mode of using them*. A man of this stamp, taking pride in his new acquisition, and not blind to his own deficiencies, reads the Journals, joins a Photographic Society, compares notes with his confreres, keenly enjoys a visit to a Photographic Exhibition, and speedily becomes an intelligent and clever manipulator."

Mr. Hughes has a high appreciation of the value to the progress of the art of photographic journalism, in which opinion we, of course, cordially agree with him. In his preface he remarks that "to the Journals is mainly due the vast diffusion of Photographic knowledge and wide-spread practice of the Art. They are so varied in their contents, the most elementary to the profoundest subjects being freely discussed, that the pupil can scarcely peruse a single number without obtaining valuable information; and no better advice can be given to the student who would perfect himself in the Art than to read them carefully."

Both to the beginner or the advanced student we can cordially recommend Mr. Hughes's book. His long practice, well-known skill, and intelligent appreciation of the science and art in all its bearings, enable him to speak with authority, and he possesses the happy art of speaking so as to be thoroughly understood. The book is crammed full of information, and will, we doubt not, soon be in the hands of all interested in photography.

CARTE DE VISITE PORTRAITS.

We have received from Messrs. Squire and Co. some samples of an elegant application of mica to the protection of visiting card portraits, which they issue under the title of "silicious laminæ." It is, of course, as transparent as glass, but as thin and pliable as paper. Placed over the portraits in the small cases prepared for their reception, they at once improve the appearance and afford complete protection from abrasion or soiling of the surface. Messrs. Squire and Co. possess unusual facilities for supplying the sheets of mica for this purpose, and also for photographic purposes generally, entirely free from imperfections. Being the patentees and manufacturers of the mica illuminated letters for attaching to shop windows, &c., very large quantities of this material pass through their hands, and they are thus enabled to assort the different qualities, and apportion each to its proper use. The finest specimens only are suitable for photographic purposes, whether as a support for the collodion film, or as a protection to the card portrait.

Whilst referring to the subject of visiting cards we may remark that we have received from Mr. St. George some very fine specimens, consisting of portraits of public characters which have been forwarded as samples of the work done at his printing establishment. The negatives are we believe also his production in his capacity of operator at Mr. Clarkington's establishment. The printing is very fine indeed; clean and vigorous, and remarkably rich in tone. They are highly satisfactory both as photographs and portraits. We may here take the opportunity of remarking in reference to the price for printing visiting cards, regarding which we had some correspondence a few weeks ago, that Mr. St. George informs us his price for this work is two shillings a dozen.

NEWMAN'S ILLUMINATING COLOURS.

We have received from Messrs. Newman, of Soho Square, some samples of their new colours, prepared especially for the recently revived beautiful art of illuminating. Incidentally, however, they possess another valuable feature, interesting to the photographer; they are essentially well suited for colouring backgrounds, in either paper prints or glass positives. They are easily applied, possess much vigour and depth; and dry perfectly "flat" or dead, without giving the flat, inartistic effect usually produced by the dead back grounds in which body colour is used. We shall make some further experiments, and report as to details of manipulation.

Photographic Notes and Queries.

THE TANNIN PROCESS.

SIR,—The suggestion made by you to take a hair pencil and dip it in a solution of albumen (3 water and one egg) and to pass a thin film of it (which on drying becomes almost invisible) of the breadth of one-eighth of an inch round the edge of the plate in order to attach the collodion for the tannin process, is complete in its success. It does not interfere with the definition of the picture to the edge, and I have washed plates 8×10 with a strong flow of water, and the collodion adhered well: but to check the possibility of cracking, I began the development by adding at least three ounces more of water to the albumen, and pouring it over the plate. The plate was collodionized one day, exposed the next, and developed in the evening. Nothing went wrong, and the film was flat and adherent. Five grains of tannin to an ounce of water alo quite enough. F. F.

THE COLLODIO-ALUMEN PROCESS.

SIR,—I shall feel obliged if you or any of your correspondents practising the collodio-albumen, would describe the best plan to wash the stereo plate *after the last sensitizing*. I have read attentively every article in the NEWS from the commencement, and have practised the above with pretty good success, but still think further information required. I can well understand that you are not likely to over-wash the plate after the first bath, but it appears to me from my experience that some limit or system is necessary to obtain *uniform* results, in the last washing, to do just sufficiently, and no more, for the plates to keep, say about two weeks in summer? Mention has been made once or twice in the NEWS respecting a final wash in a weak solution of salt and water, but not sufficiently explicit.

2nd. In working with wet collodion which developer will bring out the picture with the *least* exposure, *iron* or *gallic* acid?

3rd. In your opinion, which is the best way "following the method recently described in the NEWS, pouring a small quantity of water over the exposed plate before development" to add the acetic acid to the water, or to keep to the usual formula, mixing the acid to the iron solution.

4th. Which is really the best way to intensify after developing with iron, to flood the plate with a weak solution of silver and acid, and continue the iron development, or intensify with pyrogallic as of old?

5th. I have just now been trying two plates from the formula mentioned in last Friday's NEWS, page 207, Hannaford's method. I have seen nothing to excel them as negatives, they develop clearly and free from stains, markings or blisters, the exposure shorter by a minute than collodio-albumen; but as I only prepared the plates on Saturday, exposed them in a day or two, and developed them at once, I cannot have any idea how long they will keep, so that my fifth question resolves itself into this: Can you suggest a way that plates prepared by the Michael Hannaford method will keep about 8 or 10 days in summer.

With my best thanks for former answers, I am, yours sincerely, W. S.

[A thorough final wash of the excited collodio-albumen plate is necessary in order to ensure good keeping qualities, and clean even development. We believe this is the practice of of Mr. Mudd, the best collodio-albumen operator we know. Where a final wash in salt and water is adopted there is sometimes a tendency to want of vigour, but a wash of gallic acid after the salt and water, has been found to remedy that. 2. Wherever iron can be used as a developer, it is undoubtedly more energetic than gallic or pyrogallic acid, and brings out a latent picture with less exposure. 3. Pour a little water without acid over the plate, and have the acid mixed with the developer. In some cases it is thought that the application of acetic acid to a latent image would destroy some of its most delicate tones. If the light have any tendency to oxidize the parts of the silvered film on which it acts, the addition of free acetic acid might cause the formation of acetate of silver. 4. The simplest method of intensifying is simply to wash the plate, after bringing out the details with iron, and apply a pyro developer and a little silver until the right density is obtained. 5. Mr. Hannaford believes that plates prepared on the plan he has suggested will keep as long as Fothergill plates. Experiment must decide the question.—ED.]

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 8th May, 1861.

M. Poitevin has communicated an interesting paper on certain photographic processes upon which he has experimented. It has been observed long ago that the salts of the sesquioxide of iron are brought to the state of salts of protoxide, by the action of light in presence of certain organic compounds, such as alcohol, ether, &c. Desiring to apply this property to photographic printing, M. Poitevin sought for non-volatile reducing agents. The salts of the sesquioxide of uranium reduce themselves by the action of light in presence of organic bodies, as paper, for example, react upon the salts of iron, by the salt of protoxide of uranium, which is first formed: acetate of ammonia, alloxanthine, glycerine, and especially tartaric acid, also give very definite and useful reactions in photography. Although this reduction is common to all the salts of iron, and even to the protoxide of iron, which M. Poitevin also experimented upon, he stopped with the employment of a mixture of perchloride of iron and tartaric acid. These observations will be confined to these two substances.

The partial formation of gallate of sesquioxide of iron on paper and on other substances to produce photographic images, is based upon the reduction of the perchloride of iron into the protochloride, which is formed only in those places which are submitted to the action of light.

The application of powdered carbon and coloured pigments or vitrifiable bodies rests upon another property, which M. Poitevin thinks he was the first to take notice of: this is, that perchloride of iron and tartaric acid, dissolved in certain proportions, and applied upon any given surface, then dried, either artificially or spontaneously, in the dark, give a uniform coating of a non-crystallizable and non-hygrometric compound, and which remains in that condition so long as it is not exposed to the action of light, but which becomes deliquescent in the sun or in diffused light. In the parts influenced by light, M. Poitevin ascertained the presence of protochloride of iron, which is very deliquescent, and of a body possessing an acid reaction, and very attractive of water, which is formed by the reaction of chlorine upon tartaric acid: it is this last product especially that plays the most important part in the application of the dry powders upon the photogenic surfaces employed, for there is not sufficient formed to make the colours adhere when the proportion of tartaric acid is diminished.

The following is the modus operandi:—

1st. To print with *gallate of iron* (ordinary writing ink) make a solution consisting of 10 drachms of perchloride of iron in 100 drachms of water; then add 3 drachms of tartaric acid, filter the solution, and preserve it out of the action of light. To prepare the paper, pour this mixture into a dish, and float the paper on its surface, carefully avoiding bubbles; it is lifted out immediately, drained, and hung to dry in a dark place, or it may be dried at a gentle fire. The paper prepared in this manner may be preserved in a state fit for use a long time. Its colour is deep yellow. When to be printed on it is put into the pressure frame, under a negative or other design to be reproduced, and exposed to the light until the yellow colour of the paper as seen through the negative has disappeared, and an image of a deep yellow colour appears on the white ground of the paper. To convert this image into a picture in black ink, the impressed paper is plunged into distilled water quickly, and afterwards into a saturated solution of gallic acid, or into an infusion of nut-galls, or preferably into a mixture of gallic and pyrogallic acids, according to the blackness of the tone it is desired to obtain. In either case the organic acid forms ink only on the parts where the perchloride of iron has not been decomposed, and is without action on the protochloride which covers the other parts of the proof which have received the action of light. In this manner a direct impression is received. To fix the image it is only necessary to wash the proof in distilled or rain water.

2nd. Carbon printing, and printing in powdered colours, painting upon porcelain, enamel, &c.

In practising the preceding mode of photographic printing, it has been remarked that the paper became very permeable to water in those parts which received the action of light. This property, M. Poitevin turned to account to form images with various coloured powders; to this end it is sufficient to moisten the back of the paper with gum-water, which passes through the paper and retains the powder-colours applied with a brush. Subsequently, upon substituting a ground-glass surface for the paper, and covering it with the mixture and drying it, it was remarked that after exposure to the light passing through a negative, the parts influenced became humid spontaneously, and that the preparation, from being dry, had become deliquescent in those parts only; this fact suggested a new mode of printing, which may be described as follows:—

Make two solutions, one containing 10 parts of perchloride of iron to 100 parts of water, the other of 8 parts of tartaric acid in 100 parts of water; equal volumes of these two solutions are mixed together in such quantity as may be required. Upon the surface of a finely ground-glass plate well cleaned, or even upon a plate of polished glass, previously covered with collodion or other medium; the above-named mixture is evenly poured, allowing the excess to drain off. The plate is left to dry spontaneously in the dark, placed in a horizontal position, or dried at the fire, according to the thickness of the coating of the preparation it is desired to obtain. The plate, when dried may be kept, in the dark, a long time fit for use. The impression is made through a negative; the time of exposure will be about five to ten minutes in the sun; the time varies according to the season and the intensity of the negative. On removal from the pressure-frame the design is scarcely visible on the plate; but it soon becomes so in the humid portions which have been acted upon by the light. This humid portion admits of the coloured powders adhering to the plate, wherever it exists, and the design gradually appears under a brush charged with dry colour. The picture may be preserved in this state; it is permanent, but it is better to remove with acidulated alcohol and then with water, those portions of the mixture which have experienced no modification by the action of light, they are insoluble in pure water; the plate is then dried and varnished. By this process a transparency is obtained. If a painting on glass is desired, mineral oxides or enamels are employed as coloured pigments, and the glass plates placed in muffle furnace at a temperature sufficient to fuse the flux or enamel; porcelain or enamelled surfaces are treated in the same manner.

When only a proof on paper is desired, powdered carbon or other pigments, insoluble in water, are employed, and the paper on which the design is impressed is covered with a layer of simple collodion, then wash the paper with acidulated water to remove the excess of the preparation, and destroy the adherence of the collodion to the plate, and the coating is removed by means of gelatined paper. No trace of the design remains on the surface of the glass. The image may be gummed or varnished to solidify it, and the proof glued on cardboard.

It was also remarked that this preparation of perchloride of iron and tartaric acid possesses the property of retaining fatty bodies only those parts which have not received the action of light, and affords a means of photographic impression in fatty ink, and of chemical engraving.

It is often desirable to repair the damaged silvering of looking-glasses, but the operation is very difficult. The following process is the result of several experiments, which assure success if proper skill be exercised. The spot denuded of silver is carefully cleaned from dust and grease with a tuft of cotton, so that no stain remains around the margin.

Then with the point of a knife cut out a piece of the silvering from another piece of looking-glass, a little larger than the place to be prepared. Upon this a globule of mercury, say as large as a pin's head, for a piece of tin the size of the thumb-nail. The mercury spreads immediately, and penetrates the tin as far as the margin marked with the knife's point, and permits the tin being removed to the place to be repaired. This part of the operation is the most difficult, when successful, the spot is gently pressed with a piece of cotton, it unites with the other portion of the silvering, soon becomes hard, and the new piece cannot be distinguished from the old.

THE STEREOTROPE.

Sir,—Will you allow me to offer a few explanatory remarks in reference to Mr. Clarke's criticism of the stereotrope, which appeared in your impression of the 26th ult.

First of all, as to only half the picture being visible. This was purely an accident, and was occasioned by some person having unwittingly pushed forward the mirror, so that it intercepted the view to the extent of very nearly one-half, as stated by Mr. Clarke. Upon discovering this mishap, I instantly rectified it, and, by inserting a small paper wedge, prevented its recurrence during the remainder of the evening. I need hardly say that the conical apertures are made to subtend exactly, the pencil of rays coming from the picture, and that to enlarge them would consequently serve no purpose.

I am not, however, surprised that Mr. Shadbolt, under the circumstances, should have suggested that alteration, and can only regret that he, together with Mr. Clarke and other gentlemen, should have examined the instrument at such an unfortunate moment.

Then as to the jerking appearance of the steam-engine, I am bound to admit that certain of its parts, viz. the fly-wheel and the governor, moved in a spasmodic and irregular way, not, however, for the reason assigned by Mr. Clarke. I have only a single remark to make about the governor: the pictures, in consequence of my overlooking the fact that its speed was relatively greater than that of the engine itself, did not fulfil the conditions of a perfect revolution. It should, while being photographed, have been thrown out of connection and moved-on an eighth between the several pictures of the series. The cause of the to-and-fro movements of the wheel will be readily understood from the following considerations. If I photograph a wheel which has *eight* spokes at *eight* equal intervals in a single revolution, the pictures will be exactly alike, because the spokes are all identical as to size and shape; and such a set of pictures in the stereotrope would exhibit the wheel as absolutely stationary. If, however, as in the case of the eight pictures in question, there be *six* spokes in the wheel, the effect becomes more complex, some pictures of the series being alike, and others different; whereas they should all differ in a certain definite degree. This difficulty in representing wheels in movement may be overcome in the following way. Supposing that you are about to take *eight* consecutive pictures, move the wheel on between each, *not* one-eighth of its entire circumference, but *one-eighth* of the distance between any two of its spokes. This expedient, which I have tested experimentally, results in a beautiful steady equable movement of the wheel. In regard to the wide issue, raised by Mr. Clarke, that it is impossible to exhibit continuous movement by means of pictures which represent merely certain stages of those movements, I have simply to appeal to the facts. However improbable it might, *a priori*, seem, it is nevertheless true, that the imagination supplies perfectly all that is wanting to a perfect delineation of the movements, in the pictures themselves, provided always that the difference between any two proximate pictures be not too great.

This very curious and interesting fact forms an essential feature of Professor Plateau's beautiful invention, the Thaumatrope, to which I have merely applied the stereoscopic principle, together with certain modifications, which give a clearness and minuteness of definition, which were not attainable in the simpler form of the instrument. In the hope that these observations may not be altogether destitute of interest to the general body of your readers, and that they may be held to meet adequately the objections of Mr. Clarke, the spirit of whose remarks I most heartily appreciate, I am, sir, yours respectfully, Wm. Thos. Shaw.

10, *Clarendon Villas, Mildmay Park, N., May 6th*, 1861.

NEGATIVES WITHOUT A SILVER BATH.

Dear Sir,—With some degree of pleasure I send you my method of taking positives or negatives without a nitrate of silver bath. Although I have been busily engaged in bringing it to a somewhat manageable process, it is not so perfect as I could wish; but still I think it very satisfactory for what it is, and promises to become of some practical value. After giving up several methods by which I obtained faint impressions, I found the following the most satisfactory. I first coat a glass plate with plain collodion, containing no iodide or bromide; when dry, or nearly so, I coat over again with an alcoholic solution of iodine, about the colour of port wine. This as it is, of course, is not sensitive to light, but becomes so upon the application of a weak alcoholic solution of nitrate of silver, poured on the same as collodion, it is made as follows:—

Alcohol	1 ounce
Aqua dis.	1 ounce
Nitrate of silver	10 grains

This must be kept moving over *the plate* until the yellow iodide of silver is formed; when this is complete, drain off and expose, return without loss of time to develop; to accomplish this, I first wash until greasiness disappears, then develop with:—

Protosulphate of iron	20 grains
Acetic acid, glacial...	15 minims
Aqua dis.	1 ounce

Pour over the plate, and when it flows freely over the plate, add a few drops nitrate of silver solution. The image now begins to appear rapidly. When fully out, wash and fix as usual; it can now be intensified by any of the usual processes. It is important to wash the plate before developing, or the solution would not flow freely, but I think this is best done after exposure, by so doing, I have found the plate much more sensitive. I have also produced good pictures with albumen, gelatine, &c., treated in the same way. I have also succeeded in getting pictures with other metallic salts, but I did not find the results sufficiently encouraging to proceed in these experiments. I have sent you a specimen taken by this process, for your inspection, I know it is anything but perfect, it is just sufficient to show the possibility of another process. The picture No. 2, was taken with iodized spirit varnish, and nitrate of silver bath, but without the use of collodion. This specimen was taken more than two years since. Apologizing for thus taking up your valuable space, yours truly, Edward Smith.

8, *Old Bond Street, Bath, May* 7, 1861.

PHOTOGRAPHY AND THE EXHIBITION OF 1862.

Sir,—You appear to intimate, in your last number, that the photographs to be exhibited in the great International of 1862, will be classed in the section *mechanics!*

Should such be the case, I, for one, shall certainly decline to exhibit at all, and as I find that feeling is pretty generally entertained, the foreigners may very possibly have an opportunity of walking over the course without being pitted against some of our best men.

We have had ere now sharp internicine contentions about the nomenclature of the "art" or "science" of photography, which it would appear we should have fared better to have left balancing, like Mahomet's coffin, between these niceties of discrimination; or to have quietly contented ourselves with either of these king Logs, than to have been unceremoniously bundled out into "mechanics." I hope that the council of the International may see fit to revise this arrangement. I am, sir, yours,

"A Brother Chip," but no Carpenter.

Talk in the Studio.

Photographs of Eminent Men.—We have received from Mr. Mayall the first of a monthly series of portraits of eminent men which he is about to issue. The portrait before us is that of Lord Derby, and is an exquisite specimen of photography as well as a fine work of art. It is in many respects, in our opinion, incomparably the best of the numerous illustrious photographic portraits which have from time to time been issued. The lighting and general arrangement of accessories tends to produce very fine chiaroscuro, whilst the delicacy and perfect modelling of the features and head generally leaves nothing to be desired. Lord Brougham and others will, we understand, follow in succession.

Art Photography.—We have received from Mr. Rejlander two exceedingly fine art photographs. The first is a portrait of the artist himself dressed in Garibaldian costume, the effect of the red shirt being unmistakeable in the monochrome of the photograph. The features and general effect of the head very much resemble the portraits of the Italian hero; but the expression is more that of the refined and imaginative artist than the soldier. It entirely satisfies us as to what a portrait of Rejlander should be, and is consequently placed amongst the most cherished gems of our portfolio. The other is entitled "The Evening Sun," and represents a partially draped female figure with hand shading the eyes gazing towards the horizon at the declining luminary. The lines of the figure are very fine, and the folds of the drapery quite statuesque. The whole picture is full of poetry.

Photography for Book Illustration.—We always notice with pleasure the progressive advance in the use of photographs for book illustration. Unfortunately it has not unfrequently happened that when prints have had to be rapidly multiplied, they have been of such a character as to afford very little encouragement to those most concerned in the matter, commercially. A signal exception to this has, however, just come under our notice. A cheap edition, just issued, of Wilkie Collins' powerful novel, the "Woman in White," is embellished with a photographic portrait of the author, The photograph is by Messrs. Cundall and Downes, and reflects credit at once on the art and artists. Several from which have seen from different negatives, although varying in character, are all good. The head is one, which from the impress of character, at once powerful and imaginative, will satisfy the reader as well becoming their notions of the author of one of the most exciting novels of the day.

Copyright in Works of Fine Art.—The Attorney-General's new Bill for Amendment of Copyright in Works of Fine Art, was read a second time on Monday night, and ordered to be committed on Thursday. Some discussion arose on various points of detail, but no exception was taken to any point which would in any material degree affect photographers.

Photographic Studio Burnt.—The extensive establishment of Mr. Steel, photographer, was destroyed, a few days ago by fire. The gallery, laboratory, and printing rooms were all burnt, together with upwards of a thousand negatives. The fire originated in a neighbouring building. Mr. Steel was, unfortunately, not insured.

Art Treasures.—The *Athenæum* referring to the recent art purchases in Italy for the South Kensington Museum, refers to the value of photography as an aid in popularising art. The Campagna acquisitions consist of marbles and torra-cottas, statues, bas-reliefs, groups, &c., almost entirely of the great epoch of the Revival of Art, the Italian "*quattro-cento*." There is no doubt that the novelty alone, in this country, of original works of such world-renowned artists as Michael Angelo, Donatello, Ghiberti, Verocchio, Jacopo della Guercia, Rosellino, Desiderio di Settignano. &c., will excite at least, the curiosity of the general public, whilst artists and connoisseurs are likely to be impatient to see and judge for themselves of their merit and importance; it is, therefore, tantalizing to have to await the slow progress of bricks and mortar. The delay. however, appears unavoidable, as for a long time there has been no space at command at Kensington for the exhibition of previous acquisitions of a similar nature. The Science and Art Department are, however, doing their best to atone for the delay in causing the collection to be reproduced by means of photography, so that the public will at least be able, very shortly, to form an estimate of it, through the medium of that invaluable handmaid to Art.

To Correspondents.

U. A.—The name of the elementary works on chemistry is Legion. "Wilson's Chemistry," published in "Chambers' Educational Course," is a good one for beginners. 1. The names you mention are not all makers of lenses, some are dealers; those of No. 2 we use ourselves, and prefer to any we have met with. They possess the characteristic you require. 2. Chloride of gold should be neutralized with bicarbonate of soda, adding a little at a time, and carefully testing with litmus paper. In our own practice we simply neutralise with bicarbonate, and often use the solution so without the addition of any other salt of soda. 3. Where grains of acetic acid are accidentally given in a formula, minims are meant. 4. We prefer the use of oxide of silver for neutralizing a bath. 5. If you find kaolin satisfactory in decolourizing the bath, you have no object in change. We use it ourselves. 6. Your silver probably contains some impurity. See discussion at last meeting of the North London Society. 7. We have tinted paper photographs successfully with Newman's powder colours. The majority of the back numbers of the News are in print, and you can obtain them direct from the office by addressing the publisher.

D. Hornby.—We cannot direct you to any one work giving instructions for the manufacture of electrical and chemical apparatus. Faraday's "Chemical Manipulations" is, we believe, out of print. Greville Williams' "Handbook of Chemical Manipulations" contains much of the information you require. "The Boy's Play-book of Science," although possessing a somewhat juvenile title, is full of valuable hints on construction of apparatus.

T. P. E.—It is quite impossible for us to estimate the probable amount of silver in your waste solutions, or the amount of liver of sulphur necessary to precipitate it, as it depends on circumstances we have no means of knowing. Take a quart of the solution and test carefully the quantity of liver of sulphur necessary to be added to precipitate all the silver it contains, you will easily see when a black precipitate no longer falls. You will from that be able to estimate the amount require to precipitate the whole in your tank.

W. S. B.—The deposit to which you refer is caused by too rapid reduction of the free nitrate on the surface. A little nitric acid in the bath will remedy it without at all injuring the bath for positives. We have no faith in the especial value of secret dodges and formulæ. The formulæ you use ought with careful management to give very good tones. Perhaps the most silvery tones are produced by the protonitrate developer. Good results are generally due to a number of causes—chemicals all in good order, lighting judicious, manipulation careful, in fact, in the general harmony of the whole of the operations—not in tricks, secrets, and dodges. Bisulphide of carbon can be had of the chemists, the price will depend on the quantities in which you purchase. It is an active solvent of gutta-percha, india-rubber, &c. It is also used in optical experiments for certain purposes where its especial refractive powers are valuable.

S. F.—Your negatives are very far indeed from being perfect; but it is difficult to state the cause. They are very much under-exposed, and the collodion appears in very bad condition. Try adding half a grain of bromide of cadmium to each ounce of collodion; let it settle well, so as to avoid using it when turbid; filter your bath, avoid dust, and work carefully. Let us know your further results. The formulæ used appear all right enough.

James Forster.—A strong silver bath, say 40 grains to the ounce, acidified with nitric acid, and a protonitrate developer, give the whitest positives; but the application of a spirit varnish generally deteriorates the beauty of a glass positive, as indeed do all heavy-bodied varnishes. Try the varnish sold by Messrs. Squire as Alabastrine Varnish; it will not lower the brilliancy or whiteness of your picture at all. The specimen of intensifying you enclose illustrates the value of the process.

R. Gordon.—If you forward your address we will endeavour to advise you by letter: but cannot do so here.

Z. B.—We cannot recommend you to use any toning bath in which the gold and hypo are mixed. It may give fine looking results, but the risk of fading will be great. Use the alkaline gold toning process.

F. M. L.—The postage is a penny as in England. The subscription for the year is, therefore, 17s. 4d.

Economy.—Liver of sulphur and polysulphide of potassium are the same articles, and the smell is as disagreeable as you describe. The price you name is what would probably be charged for an ounce. It would be cheaper by the pound.

An Unfortunate.—There are a variety of methods of removing fixed stoppers from bottles depending on the fixing cause. Allow a few drops of water to permeate if possible between the stopper. Tap the stopper smartly but gently with a piece of wood. Heat the neck of the bottle, either by a flame or by friction. Tie a piece of string round the stopper and endeavour to jerk it out. Some of these means will probably succeed. We fear the silver stains in the table cloth, if they were not removed at once, will be difficult to remedy, cyanide of potassium will be most likely to effect the removal as far as possible. The treatment you propose for your silver bath is right.

F. E. G.—We will mark the pictures as you desire, so that we need not enter into the subject here.

H. B. Y.—Your method of proceeding was quite right, but from the results you describe we fear the pyroxyline is bad, from having been made a very low temperature, which would cause the thick glutinous effect you describe. You may possibly remedy the evil by adding ether until the collodion is sufficiently limped; but we fear it will never be good. The proportions we gave, if the cotton had been reasonably good, would have given you the proper consistency. Mr. Hardwick's Chemistry is the best for your purpose.

Y. S.—Your prints are deplorable. The negatives can have no intensity. Get better negatives more vigorously defined, and use a silver bath of at least 60 grains to the ounce, and your results will be more satisfactory.

R. Stephens.—We will write to you.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 141.—*May* 17, 1861.

RAPID DRY PROCESS.

We referred a few weeks ago to some prints we had received from the Rev. J. Lawson Sisson, described as from negatives by a very rapid dry process. We have since received from Mr. Sisson full particulars of his process, with permission to publish them; one condition only being attached to the permission. The condition was that we would ourselves fully try the process, so as to receive the fullest assurance of its value, prior to any publication of the details.

We have made some of the preservative preparation, and prepared a few plates, the results of which fully confirm Mr. Sisson's statements as to rapidity. An exposure of about fifteen seconds in a dull light, with Dallmeyer's Stereo lenses, and a three-eighth stop was sufficient. In a feeble sunlight we gave five seconds exposure, with the same lenses and a half-inch stop, which appeared quite sufficient. To afford a comparative idea of the amount of sensitiveness, we tried a tannin plate under precisely the same circumstances as to light, lens, stop, &c.; to this we gave an exposure of seventy-five seconds. The results in the two plates were very similar as regards exposure and general qualities. So far as this single experiment would indicate, the new process is fifteen times more sensitive than the tannin process. We must not omit to state the fact, however, that the rapid plate was developed with iron, whilst the tannin plate was, of course, developed with pyrogallic acid.

The preparation of the plates is very simple and easy, and the development rapid and clean. We hope shortly to try some more complete and comparative experiments, and also to receive the report of the experiments of a few skilled friends in dry photography, to whom we have supplied some of the preservative for trial. We shall then lay full particulars before our readers.

THE AMATEUR'S PHOTOGRAPHIC ASSOCIATION.

We call the attention of our readers to a prospectus which accompanies the present number of the News* of a projected Association having for its object the interchange and publication of the productions of amateur photographers. To become a member, it is necessary to send six or more good negatives during the year for publication, and subscribe a guinea. In return for this each member is to receive two guineas' worth of prints, estimated on a scale determined by the association; members will also have the privilege of being supplied with any additional copies of the prints published by the association at half the publishing price; and they will also receive one-half of the profits of any additional copies from their negatives which the publishers may sell.

In addition to these arrangements for membership, provision is made for admitting *subscribers* into certain of the privileges of the association without becoming members. Subscribers are exempt from the obligation to contribute negatives, an annual subscription of one guinea entitling them to a selection from the photographs of the association to the amount of their subscription, and to additional copies at three-fourths of the publishing price.

Four prizes will be awarded during the year for the best negatives forwarded: the prizes to consist of gold medals, of the value respectively of twelve, seven, five, and three guineas.

These and a few minor features constitute the chief aims of the association. The project is ingenious, and many of its objects are desirable; but we must confess that we do not look upon the probability of its successful issue with anything like enthusiasm. We see more difficulties in the working of such an association than are probably anticipated.

It is stated in the prospectus that this will become an "exchange club" of the most comprehensive kind. Now we have had some experience in the working of an exchange club, based on very simple and self-working principles. As a whole, the stereoscopic exchange club, established and worked out in connection with this journal, has been decidedly successful and satisfactory; but it has been because it has been self-working, involving little risk, and containing within itself its own corrective elements. Those who were dissatisfied with one exchange need not repeat it with the same member; had the amount at stake been heavier, we believe that dissatisfaction must frequently have arisen. The productions of different amateurs are necessarily so unequal, in a value which cannot be measured by the number of superficial inches of paper covered, that where such a standard is adopted in estimating their exchange value, disappointment must frequently ensue. If it be the duty of the committee to select or reject negatives for publication, their task, if executed with justice to all, will be anything but an enviable one; and however judiciously conducted must often issue in offence and annoyance.

There are some other details in the prospectus which are open to stricture: but as our object is not to throw cold water upon the scheme, but rather to point out some of the difficulties which will have to be met, we will not comment further on the matter at present. The committee include the names of some eminent amateurs, whose countenance will claim consideration for the association. We shall refer to the matter again shortly.

* We ascertain at the last moment, after the "formes" are "made up," that the prospectus will not be ready for issue in our present number, but will appear in our next.—Ed.

STAINS AND STREAKS IN THE NEGATIVE.

It is an unfortunate fact that the above heading is one which will at once interest a very large proportion of photographers; as there are few, however successful or eminent, who are entirely exempt from such troubles. At the last meeting of the Photographic Society, Mr. Thomas read a long and elaborate paper, a condensation of which will be found in another page, entitled "How to prevent stains and streaks in the negative." Mr. Thomas refers all these evils, or at least nine-tenths of them, to one cause, too much light in the dark room. Some of our readers will be disposed to smile at such a solution of their difficulties. That excess of light, or indeed *any actinic* light, in a dark room is an evil here can be no doubt, but that a cause, adequate at most according to Mr. Thomas's own showing, to the production of a certain kind of streak under certain circumstances, should be set down as the all but universal cause of all kinds of streaks and of stains besides, is, we think, to young and inexperienced photographers at least, a dangerous and mischievous doctrine.

The illustrations intended to confirm this notion, and to show how streaks might be present on the background and not on the figure, were most singular. Mr. Thomas laboured most patiently and most assiduously to prove what, we will venture to say, never entered into the mind of a gentleman present ever to doubt, namely, that the continued action of light would destroy a faint image already impressed on the collodion film, and announced the discovery of that fact as something unexpected and startling. Why, is not every photographic portraitist aware that the delicate detail and minor folds of light drapery are obliterated by the continued action of light? Do not all old Daguerreotypists remember the practice of covering a gentleman's shirt breast with a piece of black cloth for the first half of the sitting, just snatching it away towards the end, in order to prevent the white shirt from being "burnt out," as was the expressive phrase used? Do not all landscape photographers know, to their cost, that the faint impressions of clouds received certainly enough at the commencement of exposure, are quite obliterated by the effect of the prolonged exposure to the sky, which the landscape demands? And do not all these and a hundred other familiar illustrations simply indicate the fact, which Mr. Thomas's elaborate detail of experiments and the four negatives produced, were to demonstrate? But when this is admitted it goes but a very short way, that we can see, to prove that the presence of actinic light in the dark room is such a universal cause of stains.

We are disposed to affirm, moreover, that too little yellow light is quite as likely, in many instances, to be a prolific cause of stains, especially in developing. Mr. Thomas doubted the possibility of obtaining yellow or orange glass which would not admit the actinic rays, and it is quite certain the mere colour of the glass cannot be taken as a safe guide without actual testing. But that it can be obtained is not less certain. We have worked for months in a room lighted with about four superficial feet of yellow glass without ever experiencing the slightest difficulty. We have before us at this moment three samples of yellow glass, and we have also a print on paper which shows the amount of resistance to the actinic ray of each, the glass and the specimen having been forwarded to us by an able amateur photographer. To test the samples, he mounted them in a frame of wood side by side, and placing an excited collodion plate underneath, exposed it to the northern sky for thirty seconds. The result was that the light admitted by two of the samples caused a reduction as dense as the high lights of a good negative, whilst the third, under the same circumstances, did not suffer sufficient light to pass to produce even the slightest fogging. The two first samples were apparently of deep brownish orange, whilst the third was much lighter in colour, and was moreover the cheapest article. The two first were "flashed" or stained glass, the third pot-metal.

Without entering further into this subject here, we may call the attention of our readers to an interesting detail of the experiments of Mr. Crookes, referred to by Mr. Malone at the meeting. They will be found as communicated to us by Mr. Crookes in our article "Scientific Gossip" in the present number.

We are sorry we cannot endorse Mr. Thomas's opinion that the preparation of photographic chemicals is so much improved, as to render the excited film so much more susceptible than it was a few years ago, to the action of light. We are not of those who croak that photography has made no progress. We believe that it has progressed, and that many things are much better understood than they used to be. But we cannot forget that Count de Montizon and others took instantaneous pictures half a dozen years ago or more; nor can we ignore the fact that never were complaints more rife than at the present moment, and that amongst first-class men, of the difficulty of procuring really pure and reliable nitrate of silver, and that they can seldom procure, even from the best makers, two batches of collodion alike.

The causes of stains are very numerous, and perhaps none more frequent than the use of imperfect or imperfectly cleaned glasses. The cause indicated by Mr. Thomas will sometimes doubtless cause streaks, and more frequently fog; but not, that we can see, stains. Organic matter in the bath; or the use of a simply iodized collodion when newly mixed are prolific causes of streaks and stains. A very frequent cause of stains is imperfect manipulation in the development; the plate not being covered with an even sweep of the developer, or the developer flowing back from the edges in greasy lines. A very common and often unsuspected source of streaks is the presence of scum on the surface of the bath, which, if the room be very dark, is not observed. There are other causes of streaks and stains, but these are the chief. We mention them that the inexperienced photographer may see the necessity of carefully overhauling the whole of his operations when he meets with these difficulties; and not fancy that by making his dark room so dark that he cannot move in it without upsetting something, he is forthwith to rid himself of further trouble in this respect.

Nevertheless, too much stress cannot be laid on the importance of excluding all actinic light from the dark room. The more perfect the working condition of the chemicals the more dangerous will necessarily be every stray beam of white light. On this subject Mr. Thomas's concluding remarks are interesting, and may be read with profit.

Scientific Gossip.

The important photographic chemical, hyposulphite of soda, is gradually being applied to other uses. It promises now to become a valuable agent in chemical analysis, its great disposition to form easily soluble double salts enabling the chemist to separate similarly allied elements with considerable facility. Diehl has now found that it dissolves sulphate of lime with great ease, and has proposed it as a means of separating this sulphate from the insoluble sulphate of baryta. When alcohol is added to the solution of sulphate of lime in hyposulphite of soda, the double salt separates out in the form of a heavy oily fluid, congealing into white crystalline needles, and mixed with hyposulphite of soda. The hyposulphite also exerts remarkable solvent powers on the ferro and ferri-cyanides of copper, lead, silver, and mercury, while it will not touch the corresponding compounds of zinc, manganese, cobalt, nickel, cadmium, and tin. It is much to be desired that these curious solvent powers of this salt were fully investigated; besides the advantage which chemistry would derive from a knowledge of such reactions, photography could not but be benefited by any researches which would throw light upon the obscure actions of one of her most valuable agents.

Mr. King's experiments on the loss which light experiences by its passage through glass plates of different qualities, an account of which we gave in our "Scientific Gossip" for Jan. 11, have attracted considerable attention, both in this country and in America. We know of more than one artist who has been much benefited by the results which we gave, in the construction of a glass room, and they will be pleased to hear the results of some further experiments on the same subject, upon which Mr. Storer has lately been occupied, in consequence of Mr. King's researches. Mr. Storer employed, instead of lamp shades, flat sheets of glass (ordinary window panes) six inches wide by eight inches high. These were fitted to a rack of blackened wire, which was fastened to the photometer bar (100 inches long) at a distance of three feet from the gas light. It did not appear that the distance from the source of light at which the glass screen was placed had any appreciable influence upon the amount of light transmitted by it, at all events no such influence could be detected in a number of experiments made purposely to test this question. The gas employed was prepared from a good coking coal expressly for these experiments, and was contained in a special gas-holder. Its illuminating power, when consumed from an argand burner at the rate of five cubic feet per hour—as in the following experiments—was equal to 16 candles, consuming 120 grains of spermaceti per hour. The experiments were made in a blackened chamber with a Bunsen's photometer, every precaution being taken to ensure accuracy. It may also be mentioned that none of the measurements (of the distances of the photometer from the standard candle) obtained by actual experiment were calculated, *i. e.* reduced to their equivalents in candles, until the whole series of experiments was completed, and that no comparison of the results among themselves, or with those of Mr. King, was made until each number of the table had been calculated as it stands below. Whatever the experiments may be worth therefore, they have at least the merit of being entirely independent, and wholly unbiassed. The amount of light passing through the glass plates, was in all cases taken at 100, and it was found that English pale, one-third of an inch thick, obstructed 6·15 per cent.; Crystal plate, one-eighth of an inch thick, obstructed 8·61, per cent.; English crown the same thickness, 13·08, per cent.; Double English window glass the same thickness, 9·39 per cent. Double German the same thickness, 13 per cent.; whilst the same glass half the thickness, obstructed only 4·27 per cent. When glass is ground, a vast increase in its opacity to light is the result; three specimens of the above glasses rising in this respect to an obstructive power of 62·34, 65·75, 62·74, per cent. A piece of orange-coloured window glass, such as photographers use for their dark rooms, the sixteenth of an inch thick, was found to have an obstructive power over 34·48 per cent of the rays. Purple glass the eighth of an inch thick, absorbed 85·11 per cent. Ruby glass the sixteenth of an inch thick, 89·62. Green glass the same thickness, 81·97; and a porcelain transparency the same thickness, as much as 97·68 per cent. of the incident rays. These numbers vary somewhat from those given by Mr. King; this may be explained by the fact that the window glass used by Mr. Storer was more coarsely ground than the lamp shades used by Mr. King. There can, however, be no doubt that the numbers given above express as accurately as the circumstances of the case will admit, the actual diminution of the amount of light falling for example upon the pages of a book held near to its source, which would be occasioned by the interposition of the shades above enumerated. The enormous resistance to the passage of light which is offered by ground glass, is certainly worthy the attention of those using it for glazing the whole or any part of their glass rooms; whilst the comparatively small amount of light (34·48 p. c.) obstructed by orange glass is also worth consideration.

Some very erroneous ideas having been expressed at the last meeting of the Photographic Society relative to the opacity of yellow glass to the chemical rays of light, and Mr. Malone having alluded on more than one occasion to Mr. Crookes' experiments on this subject, we have thought that some notes of experiments, which the latter gentleman made on the occasions referred to, would be of interest. The experiments were tried with a powerful spectrum camera, which was so arranged that an image of the solar spectrum, with Frauenhofer's lines crossing it, could be projected upon various sensitive surfaces, and at the same time be subjected to the absorptive action of screens of different kinds. This instrument was employed for the purpose of ascertaining the best kind of glass for the window of a photographic laboratory; one which should admit abundance of light, and still filter off, as it were, all chemically acting rays. Usually yellow calico was employed for this purpose, but Mr. Crookes found by means of his instrument that this was a most imperfect and unsafe material for such a purpose. One thickness, it is well known, allows white light to pass readily. Consequently, an increase in the number of folds merely diminishes the amount of transmitted white light, and in the same degree obstructs the illuminating yellow light. A great many pieces of glass were examined with this instrument with a view to find out some which would perfectly obstruct the photographic rays. The method of experiment was very simple. Mr. Crookes first took a photograph of the spectrum and found out the fixed line in it which acted as a limit to the chemical rays. For iodide of silver in collodion (or in any other combination (the action suddenly ceased at a point below), *i. e.*, nearer the red than) the line G, equal to one-sixth the space between the lines G and H. All the rays above (*i. e.*, nearer the violet than) that point of the spectrum (which occurs at about the boundary line of the blue and indigo) being found to affect the collodion plate strongly, whilst the rays below it were absolutely without action. Iodide of silver was, therefore, found to be *insensitive* to blue light, contrary to the usual opinion. Bromide of silver was in the same way found to be sensitive to all the rays above the group of lines *b* (between E and F in the middle of the green) and absolutely insensible to the rays below.

The problem to be solved was, therefore, very simple. Mr. Crookes had only to obtain a good solar spectrum in the field of the telescope, and having focussed the fixed line *b*, to interpose in the path of the coloured rays as many pieces of coloured glass as he could procure. All glasses which were opaque to the rays above the line *b* could safely be used for illuminating the photographic room. Amongst the most perfect of the glasses which were found in this manner suitable was a rather common kind of a deep orange colour. It was perfectly opaque to rays above Frauenhofer's line E, from the green upwards, but transmitted the lower luminous rays with facility. Mr. Crookes, therefore, employed this glass to glaze the window of his photographic laboratory, and, although, during part of the morning the sun used to shine directly through it on to the uncovered glass bath in which collodion and other plates were being excited, not a single failure could ever be traced to this cause, and whilst, in point of security, this orange glass was at least equal to four or five thicknesses of yellow calico, it was incomparably more pleasant to work by, as when the sun was shining the darkest corners of the room were illuminated as if by daylight.

DRY PHOTOGRAPAY IN THE DARK-ROOM AND FIELD.

BY H. NICHOLS.

As the numerous modifications that are constantly made tend to bother the dry-plate photographer, from being based on conclusions hastily made, and without that impartial comparative experimenting necessary to render any process simple and certain in the hands of all, with any pretensions as photographers, I beg to place before you the method which in my hands, and those gentlemen who use it, is simple and certain in its results, giving clean, sharp, and vigorous negatives, without stains or marking of any description; very sensitive, seldom requiring more than one minute exposure in mid-winter, with a lens of 5-inch focus; good keeping properties, the plates used fifteen months after preparation yielding equal results as when first prepared.

I must now conduct you into the laboratory, I would first remark, that the statement frequently made that any collodion giving a good wet negative will do, is in my opinion an error. Ignoring then all mixture of contractile collodion that has become powdery by age, or caustic alkalis,—such films when sensitized generally showing to the unassisted eye watery marble stains, soon becoming partially or wholly insensitive in light, and rapidly decomposing—the following formula I use with success:—

Soluble Cotton.

Pure nitrate of potash, coarsely powdered	20 drachms
Distilled water	1 ,,
Sulphuric acid (s. g. 1840) ...	24 ,,
Clean carded cotton	100 grains

I use a tall percipitate glass, kneading the cotton occasionally with glass spatula, and keeping it covered with a glass plate when at rest for twenty minutes, then washing rapidly in an earthenware cullender under a tap with a powerful stream of water, which soon removes all traces of acid and bisulphate of potash. Then pull out the fibres and dry in the open air.

Plain Collodion.

Sulphuric ether, (free from acetic ether	2 ounces
Alcohol (s. g. 1·815)	2 ounces
Soluble cotton	28 grains

Iodizer.

Iodide of ammonia	24 grains
Iodide of zinc	12 „
Bromide of ammonia	12 „
Alcohol (s. g. 1·815)	10 drachms

To seven drachms of plain collodion add one drachm of the iodizer.

This iodized collodion will flow freely without ripples, very porous, giving a rich film, adhering well to the glass, and will bear any amount of washing, if ordinary care is taken, will be fit for use in two days, and remains in good working condition for many months.

The Nitrate Bath.

Nitrate silver crystals	45 grains
Distilled water	1 ounce

Add to a 20-ounce bath, 4 drops iodizing solution, and 6 drops of glacial acetic acid.

Filter the bath solution with care, using good paper. I always test my filtering paper, for carbonate and hyposulphate of soda; for many of the papers lately in the market I have found to contain from 2 to 5 per cent. of those articles so useful for other purposes, but so detrimental here. I use a yellow glass bath in preference, or of gutta percha unvarnished; for as the bath solution acquires alcohol and ether, the gums of the varnish are dissolved, and fix themselves on the collodion surface, mostly in patches, sometimes all over, causing difficult development in *recent plates;* in six or eight weeks after preparation the patches become visible, although to view the back of the plate it has all the appearance of being good. After coating and sensitizing the plate in the usual way, remove into another bath of the same description containing distilled water, placing the plate the same way on the dipper, and dipping in the same direction as before, leaving it in while another is being coated and placed in the former bath; when it is to be placed on a level stand, and washed with an unlimited supply of ordinary water that has been well boiled; drain the plate on clean new filter paper, then coat with the albumen solution:—

Albumen	1 ounce
Distilled water	3 ounces
Liq. ammonia (880)	1 drachm

Shake well to a froth in a bottle; when subsided, and perfectly clear, filter through muslin into a *clean dry* bottle, this will keep good a year or more. Pour enough on the end of the plate to cover it well, letting it flow as regular in a wave as possible to the opposite end, then over in every direction well up to the edges. Pour off over the plate with water while the plate is changed from the sensitizing to the water bath, and another coated and placed in the nitrate bath. Having three plates in hand, return to the first and finally wash as before: hot water (180° Fahrenheit) may be used, if increased sensitiveness is required, without injury; above that heat difficulty in development I find the result.

Proceed to dry: first drain the plate on a pad of new filtering paper, wipe the back clean and dry, and place it about one inch away from a bottle or jar of *hot* water, film side to the source of heat, slightly inclined away at top, resting against something else, with three or four thicknesses of bibulous paper under all. When perfectly dry, my way of storing the plates is simply to place a piece of clean bibulous paper between each, film side up, in pine boxes; as long as they are kept dry they will be good, and as sensitive as when first prepared.

The next movement is to take the field. It is necessary to know how long to expose, and this rarely costs me much trouble. There may be plenty of methods better than mine, no doubt, only I don't know them. My little instrument never having deceived me, I'll describe it; it consists of a little box with a shutter fitted like a dark slide, about 2 inches long, 1¼ wide, and ⅝ths of an inch thick, which I carry in my waistcoat pocket. On the inside of the bottom of the box a piece of card, coloured purple-brown, is placed, the corresponding shade to that acquired by the sensitized paper employed. A slip of sensitized paper about half an inch wide is laid lengthways down the middle. To use it, open the shutter about the eighth of an inch, and note the time of coloration to the card.

The following formula, I find, requires about eight times longer than the plates, using *papier le Rive.* To salt the paper.

Chloride of sodium	... 8 grains
Bromide of potassium ...	... 8 „
Water	... 1 ounce

Immerse the paper three to four minutes. Pin up to dry.

Sensitizing Bath.

Nitrate silver crystals ...	... 35 grains
Lemon juice	... 2 drops

Cover a glass plate, a little longer than the paper, with the bath solution, place the salted paper in contact for three minutes, using fresh solution for each paper, never return to the stock solution, as that would alter the time of coloration, and lead to error.

One strip of the sensitized paper lasts twelve exposures, by opening the shutter about one-eighth of an inch each time; although the use of this is only occasional, I always carry it ready for use when light appears doubtful. It is called into actual service in the following way:—suppose twenty plates are prepared, place one in the dark slide, having focussed your object, expose the photometer by opening the shutter as described, noting the time of colouration; supposing that in four minutes the depth is produced, one-eighth of which is the calculated time, then expose one-half of the plate thirty seconds, the other half sixty seconds, develop the plate, using the developer hereafter mentioned; should thirty seconds be under and sixty seconds over, expose about forty-five seconds or thereabouts.

Another useful little thing, not to be forgotten is a view meter, which often saves a great deal of trouble and annoyance. It is very easily made and managed, which will be better described at another time. After the journey's end, develop the plates at leisure. Developing solution—

Pyrogallic acid	... 8 grs.
Citric acid	... 4 „
Distilled water	... 6 oz.

First moisten the surface of the plate, add to each drachm of developer one drop of a twenty-grain solution of nitrate of silver—five to ten minutes generally completes development. Over-exposed plates may be successfully treated by saturated solution of gallic acid; with added to each ounce, one drop of silver solution (bear in mind, that half the plates are spoiled by adding too much silver to the developer); wash well, fix with saturated solution of hypo, another good washing, dry it before the fire, and varnish. Gum benzoin dissolved in spirit, properly made, will never crack under any circumstances a negative is required to be used.

A few remarks on the appearance of the dried film may be useful:—They are generally opaque and lustreless, very sensitive, quickly developing—a glassy surface is generally less sensitive, requiring longer time to develop. A film having a varnished appearance generally develops with difficulty, giving a soot and whitewash picture.

Remarks on applying the albumen.—This solution, by its passage over the plate, forces out the water before it, which, with a little practice, you can force over the end, or it can be well effected by a well bath. For large plates I find it best, as the albumen can be used in succession—supposing one oz. be required to cover one plate, then for twelve plates use twelve ounces, or as long as there is sufficient to cover the plates; for if it has been properly washed the albumen remains clear, and its only purpose, as far as I can find, is to keep the pores of the collodion open, as there are many other substances having the same effect, or even better.

GROUPING AND ARTISTIC EXPRESSION.

BY L. M. DORNBACH, S.B.*

The first and most important requirement in taking a photographic picture is a faithful representation of the outlines and characteristics of the original, by which we obtain, at the same time, the most desirable and harmonious picture, satisfying the eye, and the ideal conception of the mind.

That which is very easy for the painter in the production of agreeable portraits—agreeable in conception, position, surroundings, &c.—becomes almost an insurmountable obstacle to the photographer, notwithstanding he may be provided with the best instruments and the most reliable chemicals, individual skill and the most faithful representation of the original; and, to give to the whole a spiritual or life-like appearance, belongs only to the domain of the best of painters.

The question presents itself, where the source of failure lies in accomplishing all the requirements which a perfect photograph demands? The answer is an easy one; in the want of artistic or picturesque perception and performance; or, in other words, the difficulty in arranging the subject to be taken so as to present the best possible appearance in the picture. There is some difficulty in giving practical hints, and defining the principles involved, to produce results that shall possess all the requirements that are possible in every particular case.

Viewed from a purely professional stand-point, all photographic pictures deprived of, or wanting in, artistical and picturesque properties, though they may not receive the most direct appreciation, are not the most admired, even if they are more beautiful than the originals. Concerning the want of delineation in detail, we will present those points which must be observed in artistic relations.

In grouping we have the following divisions:—First, the position of a single person; second, the grouping of a number of persons; and third, the arrangement of surrounding objects.

The first point—the position of a single person—presents the least difficulty; nor is it essential that the photographer should be acquainted with the character, the disposition, and standing of the person, a circumstance, it is true, that is seldom called into requisition. Still, in order that he may be somewhat familiar with the character of his subject, the practical photographer will take advantage of the time and opportunity in preparing to take a picture, to recognise all the salient points of character, by entering into a conversation upon general or scientific topics.

We insist upon this the much more, since it has been customary to represent all persons alike in their pictures; a sort of stereotyped attitude—a small table covered with figured cloth supporting a book. But all are not alike in their tastes, and an active business man, or a mechanic, seems out of place when taken as a literary man.

According to the result of these conditions the general harmony of the entire body, and the position to be taken, are to be determined. The age of the person whose photograph is to be taken may be considered in this place, and presents very little difficulty. The position is of much less importance when no external characteristics—costumes, robes, uniforms, &c.—require to be considered.

The first and most important general consideration is to associate whatever naturally belong together, and which are dependent upon the difference found in the human family. When the photographer is called upon to take a portrait of a single person, in a sitting position, the best rule to follow is to have the individual place himself in the chair and arrange himself naturally at his pleasure.

The just proportion, viewed from the particular relation of all the parts, must be preserved under all circumstances in the harmony, relief, immediately after the grace and beauty of composition—which should never be lost sight of—whether the person is standing or sitting. We must bear in mind, in this arrangement, that the method which succeeds best in giving a life-like expression in the general harmony corresponding in the position of the arms and hands of portraits, in which life can only be successfully deliniated, the inclination and *posé* of the head and breast, will be best for the expression of face and eyes.

By strictly following these rules, we give the person the position of a narrator, observer, thinker, &c., corresponding to the mental inclination of the individual, and consequently every case that presents itself will fall into its proper category unless the operator is very careless, and works without any taste, or is prevented by the presence of unavoidable disturbing causes.

But it must be remembered that in the application of these principles an exceptional case may arise where a picture cannot be taken by them, and above all things a stereotyped order must be avoided, a circumstance which enhances the value of every picture a hundred-fold.

In the arrangement of the individual parts of the body, the following general rules should be observed:

The head must be placed erect, within a perpendicular to the rest of the body, whether observed from before or from the side. If a front view is taken, a foreshortening of the forehead, nose, chin, &c., takes place, and the look, to which a proper direction is always to be given, is either squinting—which is never a desirable feature, being the most disagreeable of any—or, in case it is kept slightly sideways, when it is indistinct and lifeless.

For the same reasons the head should not be taken partly from behind, since, from the same foreshortening, the expression will be very tame, the eye will be small, and, what is more reprehensible, the portrait will show the nostrils too prominently. Besides, this last position gives the picture a very undesirable expression; it does not agree with the character of the person, and has little or no personality, and in every respect is a poor picture.

Thus again, let the position of the head be perfectly straight, but at the same time without constraint, and as easy and graceful as possible; it must still be kept in view that these are merely pictures of such subjects as make up the generality of persons, or, as we might call it, pictures of every-day people.

But this rule is not applicable to actors, painters, artists, speakers, &c., for here different positions must be called into play; an irregular and inclined position of the heads of portraits gives them a more characteristic expression, as well as more life and truth.

Still this is a matter of refined judgment and cultivated taste, which a skilful photographer should never be deficient in.

In connection with the position of the upper part of the body, the arrangement of the breast, arms, and hands, in relation to the position of the head and direction of the eyes, is next to be taken into consideration. The arms, hands, and breast must exactly coincide in harmony with the expression, which is introduced by the position of the head, from which it follows that they must be unconstrained, yet so situated that a proper character is thereby expressed and preserved.

An adjunct, consisting of a small table or stand of some description, is in most cases a desirable assistance in giving a finish to the picture. But this will be more fully treated of under a separate head—the surrounding objects of the tableau.

Stiffness, or want of ease, whether relating to the chest, arms, or hands, is under all circumstances to be avoided. The upper part of the body must, above all things, present a roundness and give an impression of comfortable ease. The chest is first placed in such a position, that the axis of the plane in which the shoulders lie shall not be parallel with the inclination of the head, which prevents the picture from appearing broad and disagreeably harsh.

The arms should never present parallel positions in any of their parts, but must either rest free and easy upon the lap, yet not carelessly so, or be placed in a position corresponding to the particular position of the hands, which must be so situated that they lie as near the body as possible, without resting upon the knees, nor be closed so as to make a caricature.

Not unfrequently, at least in portraits of men, it is desirable to conceal one of the hands, or at least in part, by placing them on the breast (concealed by coat or vest), or by passing a finger between two buttons of the clothing, in order that the arm may have a point of rest.

The next in order will evidently be the arrangement of the lower part of the body: this admits of very little application of any rules, with this provision, that the position of the feet must be perfectly natural and easy, and so placed as to ensure rest and security to the upper part of the body.

With a standing posture little is necessary to be done, and

* Abbreviated from *Humphrey's Journal*.

particularly in the arrangement of females, the excellence of the picture does not depend upon the particular position of the feet further than to obtain security and ease for the body, but is dependent more upon the faultless arrangement of the dress —the prevention of disagreeable folds. If the skirt hangs loose on the body, the folds of the dress will not indicate whether the person was sitting or standing. This, however, cannot be regarded as part of the domain of the photographer, yet it may be the source of poor pictures.

The operator will therefore, as far as practicable, see that the folds of dresses are properly arranged, and be particular that the position of the whole person, as well as individual parts, is properly represented.

From these outlines we may easily secure all that is desirable in a portrait: ease in posture, relief in outline, and beauty of composition, harmony in all parts, and—what is of the utmost importance in a good picture—the general impression of natural life and ease.

In our next article we will give the grouping of several persons, or the rules to be observed in forming groups.

HOW TO PREVENT STAINS AND STREAKS IN THE COLLODION NEGATIVE.

BY R. W. THOMAS.*

My object this evening is to place the subject of my paper in a practical light, by which light, I am happy to say, it is capable of being viewed; in doing this, I will also endeavour to answer an objection which will present itself in the course of this inquiry. Now let me take the subject and divide it into two heads, and then discuss these heads separately.

1st. The action of light in the camera.

2nd. The influence of light in the operating-room.

For my present purpose it will be enough to glance casually at these heads. First, the action of light in the camera. All things considered, is it not wonderful that we have a clear image in a latent state upon the highly sensitive surface of the collodion plate? Light passes equally into the darkened chamber through the full aperture of the lens; but at the focus of the lens it is also deposited, so to speak, in a ratio equal to the reflecting power of the surfaces of the objects to be copied, impressing the first atoms of the sensitive film in a degree equal, as before stated, to the amount of light projected from the bodies to be represented. Now it will be readily granted and very easily conceived how soon a disturbing influence may be brought about by the introduction of any false light in the chamber wherein this image is produced; but notwithstanding this incontrovertible fact, there are those who remain careless as to the manner of rendering the camera absolutely dark. I have said that the light given off from the objects to be copied impresses the first atoms of the sensitive film, and I firmly believe that the first atoms only are affected in the camera.

In furtherance of this proposition, let us imagine for a moment that a bundle of thin surfaces of any material sensitive to light be placed (say, for the better comprehension of the subject) at the slightest conceivable distance apart in the focus of the lens, the colour of each and all of the surfaces being antagonistic to the action of chemical rays (in other words, yellow, the colour of the iodide of silver in the film), and the homogeneity of the colour favoured by the circumstance that light is not passed absolutely through these atoms (that is to say, the back of the dark slide being closed, translucency of the supposed thin yellow surfaces is prevented). Now what will be the result (keeping this arrangement in view) of the action of light? Undoubtedly the image of the object to be copied will be deposited upon the first surface of the suppositious arrangement, and there receive a check. You will grant that the next surface must, if at all impressed, be so through the yellow medium of the first; and so, of necessity, the light parts with a portion of its actinism; and having thus passed through the two yellow surfaces, I doubt whether any other of the series would be effected. I have made use of this hypothetical arrangement of surfaces for the convenience of explanation only. To those conversant with chemical philosophy, the iodized collodion film, whether $\frac{1}{16}$th of an inch or 1 inch thick, would equally afford an exemplification of the theory advanced.

I now proceed to examine the action of light in the dark room. I think it will be allowed that the more sensitive a prepared plate is to objects in shadow, the more sensitive it will be to yellow light; and if a preparation could be made, capable of producing a landscape in the camera illumined by moonlight, I need hardly remark that it would be necessary (arguing in the abstract) to prepare this highly sensitive plate in total darkness and develop it under precisely similar circumstances. Such a high degree of sensitiveness would be very inconvenient, and has not yet been obtained; but such a discovery is within the bounds of probability, and the course to be pursued in order to obtain a clear image must, under such a condition of sensitiveness, be the one proposed.

Now let us for one moment take a retrospective view of the progress of the science of photography. There are those present who can remember well the time when the negative paper process was the only process employed for taking portraits; the sitting, under the most favourable circumstances of light and short-focus lens, was 60 seconds, but generally, I think, averaged 2 minutes. I will not diverge too much from my subject, for I like to keep to the text; but were it admissible in this paper, I could give some interesting historical facts concerning the earlier days of collodion. Well, what have we been doing all this time since the old paper negative process was set aside for the purposes of portraiture? The photographic chemists have been steadily advancing to perfection in the preparation of both collodion, nitrate of silver bath, and a few other less important chemicals, in order to obtain the maximum amount of sensitiveness, preserving at the same time other conditions necessary to the perfection of the result. On the other hand, let me ask what have photographers been doing all this time? Many of them have been treating these improved preparations in much the same way as the man who would take pictures by moonshine and neglect the precautions just laid down, necessary for the clearness of the image; in other words, photographers have been working in rooms with as much yellow light as was used in the old days of photography. Now I will endeavour to show the result of such a course. I will not suppose for a moment that any other than a neutral bath is being used. A plate is prepared and plunged into the nitrate of silver bath, and the door of the room closed; after a minute or so the plate is taken out and moved up and down, to equalize the action of the bath, and remove greasy lines caused by the contact of ether with water, these two not being at first perfectly miscible.

Now, at this stage all the damage is done; the so-called darkened room is by no means dark enough, the greasy lines are impressed more or less according to the intensity of the light prevailing at the time, and appear subsequently in the development as well marked as any other latent image that the lens is capable of producing. Let me ask you to call to mind the first part of my paper and its illustration. I introduced this illustration in order to prove my position at this stage of the argument; you will remember that I was at some pains to demonstrate that the image in the camera impressed the first atoms of the collodion film, and that this film, in its position in the camera, was not translucent, but opaque; hence the first atoms were impressed only; but the reverse of this takes place in the dark room; the prepared plate is always more or less transparent, and admits of light passing through it, according to the relative position of the plate, and the source of light; moreover, at this stage of its excitation it *may* be in a highly sensitive condition.

Now is the time for me to introduce the only objection that can be made to this theory, viz., how is it that I can get perfectly clean pictures with a particular preparation of collodion, and may be the same or a particular bath, and yet when I take this or that preparation I obtain greasy lines or stains? In reply to this objection, I say, in the first place, that this statement, if it be made, is only partially true, and if true the reason is evident. The most superficial observer must have been struck with the difference in the appearance of films of different kinds of collodion when immersed in the bath; some (even after a short immersion) becoming opaque, whilst whilst others remain translucent even after a prolonged immersion. I make use of this objection as the strongest proof of the soundness of my views. Is it not most clear that this very property of opacity arrests light passing through the film, and prevents the action traversing all the atoms of the mass in its entirety? Now I think I have shown the use of my first illustration. The fact is, the surface of this opaque film is (in the dark room) in precisely the same position as the first atom

* Read at the meeting of the London Photographic Society, May 7th, 1861. [We are compelled from its length to curtail this paper, but we give all that is important to its argument.—Ed.]

of the translucent film, placed vertically in the focus of the lens with an opaque body behind it, and clearly shows theoretically, what is proved to be true by experiment, that the stains are not produced in the camera, whether the film be opaque or translucent, provided due attention be paid to the quality of the yellow light in the dark room; but, on the other hand, the stains can be produced at will, and especially with a translucent film, if the light in the dark room is not of the proper quality or is too actinic. Herein we have the key to the whole position; the translucent film is more readily impressed by feeble light in the dark room, and this impression is rendered more permanent from the fact that light passes through the entirety of the atoms of the film in consequence of its translucency. I shall not again refer to this part of my subject, but will pass on to another phenomenon, which must have been to many a matter of astonishment,—I refer to the frequent occurrence of those streaks in the background of a portrait, and their absorption at the point of contact with the image in absolute focus; is not this an extraordinary fact? and, moreover, one worthy of close observation? I must confess that until I gave a great deal of attention to this subject, I was not only puzzled, but vexed at the want of a satisfactory answer. It was not satisfactory to my mind to be able to say I know how to produce and how to avoid these stains; I therefore set to work to find out some tangible reason and ground of explanation. The experiments I made appeared suggestive; I have the pleasure of handing round the results by way of illustration. Plate No. 1 exhibits the image of a circular disc of yellow tammy stuck to the centre of a piece of amber-coloured glass; this was supported vertically on a stand and a scratch made to indicate its position; a plate was prepared in the usual way, and a negative taken of the yellow disc; the exposure required was found to be three seconds. A second collodion plate was prepared, and exposed in the camera the same time, viz. three seconds, and the cap placed on the lens, an image of the same disc having been impressed; this time, however, the yellow glass with the disc was removed, and in its place a piece of white cardboard was substituted: recollect that the plate No. 2 is still in the camera. Having effected this exchange of objects, the cap of the lens is removed and an instantaneous exposure of the white card is impressed upon the latent image produced by the first exposure; the slide with the plate is then taken to the dark room and developed. Now, gentlemen, let me ask what would you expect to find,—the image of the yellow disc, the cardboard, or both? the result is that the image of the disc is scarcely perceptible, and, moreover, is not any more evident at any stage of the development than is here represented: I have ascertained this by stopping the development at various stages. Again, in the third experiment, reverse the order of exposure, that is, first impress the plate with an instantaneous exposure of the white cardboard, and then superimpose the image of the disc; in this case the result is the same, the image of the disc is scarcely visible; but let us proceed to find out whether it can be made visible. Plate No. 4 will show that this is possible; but in order to effect it, an exposure of 15 seconds is necessary, being five times the amount of exposure required under ordinary circumstances. Now I think that these experiments may be made somewhat instructive; they at any rate very clearly shew that the fainter impression becomes subservient to that more intense, and that the faint images of streaks produced in feeble light become shrouded or absorbed by the more powerful action of the image in focus.

Now, gentlemen, as supplementary to my paper, let me offer a few remarks. What is the amount and character of light which can be safely used in the dark room? In reply to this inquiry there is fortunately a very clear answer; let me state it. And first I wish to lay down as a rule, that with properly prepared collodion, no matter what the light out-of-doors be, the negative image, whether under-exposed, or just enough exposed, should more or less, on some portions, and generally of course on those parts in deepest shadow, show a bright positive surface. If therefore the surface is at all deadened with a short exposure, notwithstanding that a neutral bath be used, then I say there is too much light in the room: no better test can be had. Another guide is the behaviour of the developer. The solution of pyrogallic acid should remain bright brown for some time; too much light in the room will cause it to blacken, and in some cases throw down a loose black deposit at a very early stage of the development; I recommend every one to adopt the course I am now going to suggest. Darken the room entirely, so that no object be discernible; slits, crevices and holes will then be seen. Now let light into the room, passed through a piece of amber-coloured glass, covered closely on each side with a single thickness of yellow tammy. For the purpose of experiment, let this aperture of yellow light be as small as possible; under these inconvenient conditions of light, develope a picture, and note well its character; then find out by degrees how much larger the aperture of yellow light may be made, so that the beauty and purity of the picture be not less on comparison with the first result obtained almost in darkness, and which may be called the test plate. It will then be very soon ascertained how large the aperture of yellow light may be made with safety. Let it be, however, remembered that this experiment must be performed on a bright day, when the light is strongest upon the covered yellow glass. I do not believe that either yellow glass or dyed stuffs *alone* can be depended on; the perfection of a yellow light for photographic purposes will be found in a combination of these two substances. The number of superficial square inches of light passing through this medium must be regulated according to the position of the window through which the light passes; hence the necessity for these experiments, and the difficulty in laying down any fixed rules.

I assert plainly, that the truth of this paper lies in a sentence; you may thrust away from your minds every theory that has been advanced, bearing in mind the one statement only, that the principal cause of want of success in photography, and of streaks in the negative, is due to the introduction of too much light in the dark room.

OLD AND NEW INVENTIONS FOR PRESERVING PHOTOGRAPHS AND OTHER WORKS OF ART.

Mr. Harvey, the patentee of an exceedingly perfect portfolio, read a paper at the recent meeting of the Photographic Society under this title. His principal object was to show the importance of giving proper care to preserve works of art, which had cost much care and skill to produce, and to point out the inefficiency of the portfolios commonly in use. He then exhibited various handsome specimens of his ingenious and valuable contrivance, and pointed out their advantages, which were summed up as follows:—

1st. The mode of fastening, by hooks connected with elastic bands. It is not only simple but durable, and also most convenient; for by this contrivance the portfolio can be opened or closed in a moment, whereas the three or four pair of strings (the mode adopted in the old portfolio) require time and patience, and, besides, the tying and untying a few times so frets the woof parts of the strings, that they are soon torn off, leaving the sides of the portfolio unclosed.

2nd. Having the side-flaps on the outside. In this mode of arranging the flaps, you perceive there can be no damage to the edges of the contents of the portfolio by the strings cutting them; while, at the same time, there is a little pressure, drawing the flaps close to the sides.

3rd. At the corners, where dust could otherwise easily enter, you note the silk gussets, which effectually bar such deleterious influences. The elastic bands also serve to keep the bends of the flaps close to the edges of the portfolio.

4th. The back is suspended. By this mode the under edges of the works contained in the portfolio are effectually secured from being broken or bruised, as is always the case in the old kinds with limp backs.

5th. The side-flaps are on the outside. This advantage is twofold for whatever dust settles or dirt gathers on them can never enter within, which is not the case when they are made in the ordinary way and are placed on the inside.

6th. These flaps are got rid of, when desired, by simply reversing and hooking them on the side to which they are attached. In this position there can be no annoyance from their being in the way, and they cannot offend the taste by that unsightly and slovenly appearance which pertains to the old kinds. In fact, these protecting side-flaps, thus fastened, are out of sight, and the portfolio can be handled just as if there were none.

7th. The advantage just named applies only to those with supporting easels. By this addendum to the portfolio, the contents can be seen to the best possible advantage without their being removed from their places, just as you would turn over the leaves of a book; and at the same time a dozen persons can see them together, in the best manner without any inconvenience. The portfolio can also be placed at any required angle, and, in fact, can be made to serve itself as a table easel, on which you can incline a picture to copy, or a small canvass to paint on.

The eighth advantage is in those with locks. This gain on the old kinds, without locks, is, that you keep your collections from the curiosity of children and servants, as well as from theft, or borrowing friends who make free use with your works without first obtaining permission, and who frequently forget to return them. And to sum up all, which will make nine distinct and indispensable advantages of these patent portfolios, they are better looking, more elegant, and capable of being ornamented or finished to any degree of richness or cost.

PHOTOGRAPHY, AND THE INTERNATIONAL EXHIBITION OF 1862.

We have been favoured by Dr. Diamond with a copy of the correspondence between the Chief Barôn and Her Majesty's Commissioners, which we subjoin. We especially commend the manly and dignified letter of the Chief Baron to the attention of our readers, as worthily defining and defending the position of our art.

International Exhibition, 1862.
454, *West Strand, London, April* 26, 1861.

Sir,—I am directed by Her Majesty's Commissioners to forward for your information the inclosed copy of the decisions which they have published up to this date, on points relating to the management of tho Exhibition of 1862.

Her Majesty's Commissioners having had under consideration the arrangements that will be required for securing an adequate representation of the various branches of industry of the United Kingdom, and having had the benefit of the advice of a large and influential Committee whom they specially consulted on the subject, have determined to organise those classes of the Exhibition, which appear to admit of such an arrangement, by means of Central Committees, and to invite the cooperation of such Societies or other public bodies bodies, as are generally recognised as the representatives of these classes, in the selection of the members of the several Committees that will be appointed.

One of these Committees will bo formed in connexion with the Class of "Photographic Apparatus and Photography" (No. 14); and Her Majesty's Commissioners have directed me to inquire whether the Council of the Photographic Society would be willing to submit the names of six or eight gentlemen whom they would recommend for appointment as members of such Committee.

The duties of the Committee will consist generally in advising Her Majesty's Commissioners on tho measures to be taken for obtaining an adequate representation of the class with which it is connected—in examining the demands for space sent in by intending exhibitors, which will be classified and submitted to tho Committees in a condensed form by the officers of Her Majesty's Commissioners—in encouraging the production of suitable objects for exhibition—and in settling the final distribution of space among the exhibitors in the class.

Her Majesty's Commissioners trust that they may not only have tho assistance of your Council in tho selection of this Committee, but that the officers and members of your Society in general will give them the benefit of their co-operation, by communicating such information, or such results of their experience, as may seem likely to assist the Commissioners in those departments of the Exhibition with which the Photographic Society is mainly concerned.—I have the honour to be, Sir, your obedient servant, F. R. Sandford, *Secretary*.

Baron's Room, Court of Exchequer,
Westminster, 6th May, 1861.

Sir,—I have to acknowledge your communication of the 26th inst., *inquiring* whether the Council of the Photographic Society would be willing to assist in appointing a Committee to advise Her Majesty's Commissioners on the measures to be taken to procure an adequate representation of Photographic Apparatus and Photography, Class No. 14, and *expressing* "that Her Majesty's Commissioners trust that the Officers and Members of the Society will give the benefit of their co-operation, and assist tho Commissioners in those departments of the Exhibition with which the Photographic Society is mainly concerned."

I lost no time in assembling the Council, and laying before them your letter and its inclosuro (containing the decision as to Sections and Classes), and I have been desired by the Council to communicate to you the result of their deliberations, in which I entirely concur. It appears to them that some mistake has occurred with reference to the objects of the Photographic Society, indeed to photography itself, which it is desirable to point out and have corrected before they appoint a committee. Tho Class to which their attention is directed is Section 2, No. 14, "Photographic Apparatus and Photography" (as if photography were nothing more than the mero mechanical application or use of certain apparatus, and to be considered of less account than the apparatus itself).

The Section in which No. 14 is placed includes every species of machinery, implement, or tool which is used for the purposes of social life; and photography is the only *result* or *product*, which is placed among the machinery or apparatus necessary to produce it; it furnishes the solitary exception to what is otherwise a universal rule; even the paper on which a photograph is priuted is put into a section above the machine that is used to make it.

In the investigation of tho properties of light, upon which the visible phenomena depends, photography is as much a science as astronomy or chemistry; it has led to discoveries of the greatest interest and importance as to the composition of the rays of the sun, and the properties of the different portions of the solar spectrum, as was lately expressed in a part of Prof. Faraday's lecture at the Royal Institution. It has also enlarged the bounds of chemical science, by ascertaining the qualities of a great variety of substances with which it had to deal, and it is in these respects chiefly that I personally have any connexion with it.

In the observations of natural scenery, and in the selection of what shall be represented with referenco to the effect of light and shade, and from what point of view,—in the grouping and arranging of the principal or accessory objects for the purpose of forming a picture, photography is no doubt an art, *an imitative* art; but the Council of the Photographic Society claim for it a position (however humble) among the *fine arts* (if etching and engraving may be so placed, as no doubt *justly* they may). Photography, quite as much as engraving, gives room for the exercise of individual genius, so as to stamp a special character on the works of photographers, and give to the result of their labours the impress of the mind of each artist.

The Photographic Society has been founded chiefly with a view to promote photography in connexion with *science* and *the fine arts*, and the members interest themselves about photographic apparatus in the same manner only as a Raphael or a Reynolds might select and use the most convenient easel, the best brushes, or the most appropriate and enduring colours—the instrument is comparatively nothing. Photography consists in the artistic use of any apparatus upon a subject properly selected, and occasionlly arranged or prepared. They are quite willing to contribute as much as lies in their power to illustrate what photography has done, and is daily doing—In producing the most accurato copies of the finest works of art, ancient or modern,—in multiplying representations of the fairest or the wildest scenes of nature, and whatever art has done to adorn or improve nature in the building cities and constructing magnificent works and buildings of all sorts, from the cathedral or palace to the humblest cottage,—from the bridge that spans a mighty river to the plank that crosses a brook, or in giving enduring pictures of private and domestic life. They do not complain that the apparatus they use is put among all the other apparatus, but they do complain that results such as have been exhibited for many years by the Society, and have been honoured by the presence and encouragement of Her Majesty and His Royal Highness the Prince Consort, are deemed worthy of no better place than among tools and mechanical devices of whatever merit; and they would appeal to the Royal and illustrious patrons of their body to be rescued from the comparative degradation of being mixed up with the last improvement in ploughs or cart-wheels, or ship's tackle.

The very clear and luminous arrangement of the articles to bo exhibited, gives the greater force to the objection of the Council.

Section 1 contains all natural substances, whether mineral, vegetable, or animal, which minister to the wants and comfort of man.

Section 2 contains all the machinery and apparatus (including instruments and tools of every descriptiou) that conduce to a mechanical end; and, with one exception, it contains *nothing else*.

Section 3 contains the result produced by Section 2 acting upon Section 1.

There is something so remarkably distinct and simple in the arrangement, that it is to be regretted that its beautiful simplicity should be marred by any exception. But photography as a *result* is put in Section 2; it is the only thing that is out of place in the whole arrangement. A result that involves *thought, selection, taste*, and *sometimes design*, is put among carpenter's tools and agricultural implements! The incongruity is not so glaring, but it is of the same kind as if architecture were placed along with trowels and scaffolding, or Humboldt were put among commercial travellers.

Section 4 comprehends all that genius and labour have done in the departments by common consent called the fine arts, in which engraving has been *tardily* admitted.

But at last it *has* been admitted (now one of the latest discoveries in photography is) that an actual engraving (without the use of any graving tool) can be produced by chemical agency and the light of the sun. Is the impression from the result of such a process to be received as an engraving (which most undoubtedly it is)? and the other results of photography to be excluded? I am sorry to have troubled you at such length, but these are the views of the Council, which I have to submit to you in answer to your letter, and remain,—Your obedient Servant, Frederick Pollock.

To F. R. Sandford, Esq.,
Secretary of Her Majesty's Commissioners.
International Exhibition, 1862.

Proceedings of Societies.

Manchester Photographic Society.

The usual monthly meeting of this Society was held on the 1st inst., at the Philosophical Society's Rooms,—Mr. Joseph Sidebotham in the chair.

After some miscellaneous business, the subject of oblong stops was resumed.

Mr. Brothers, who had continued his experiments, exhibited some more specimens, showing chiefly the different degrees of intensity produced by the same simultaneous exposure with different stops, as suggested by Mr. Sidebotham, and said that there was no advantage derivable from the use of any but circular stops, as other stops drew out and distorted the lines in the direction of the stop.

The Chairman thought that such distortion was infinitely preferable to a distortion in every direction, as must be found to be the case with those who used five-inch lenses for portraiture. He had not brought forward his theory before he was as satisfied of its truth as of that of an axiom of Euclid. He thought Mr. Brothers' experiments should have been made on a smaller bust, and read a letter in the Photographic News, from Mr. Lake Price, in support of his theory, in reply to Mr. Maginn, who had discovered the same thing since the last meeting.

Mr. Brothers said he had nothing to allege against the theory, but thought the distortion was not visible to any great extent in portraits.

Mr. Wardley and Mr. Parry took some part in the discussion.

Mr. Noton produced four pictures taken with a longitudinal, an upright, a triangular, and a circular aperture. The preference appeared to be given to the one with the perpendicular stop, though the triangular one would probably have given the best effect had the opening not extended too much into the margin of the lens. The object was a perpendicular gothic monument of the late Joseph Brotherton. He said his object in experimenting in that direction was to find a means to shut off any superfluous sky, which was sometimes very desirable.

The Chairman said that the contracted oblong stops were of course not applicable to landscapes.

A discussion ensued upon the pictures on the table, by Messrs. Petschler and Mann's process, which many who had used the old Taupenot process agreed were fully equal to any that could be produced by it.

Mr. Petschler promised, on being requested by the Chairman, to develop one of his plates at the next meeting. He used, he said, three grains of pyrogallic acid to the ounce, and two or three minims of a ten-grain solution of nitrate of silver. When the details began to appear he reduced the strength of the pyrogallic acid, and added more silver. Five to ten minutes sufficed to develop a picture 9 × 7. The copies of engravings had had three-quarters of an hour's exposure with a half-inch stop.

Mr. Parry explained that, in his process, a neutral silver bath caused fogging, and this effect had made Dr. Ryley condemn the process—probably without knowing the cause. He (Mr. Parry) found that he got the best results from an acid bath.

The Chairman reported very favourably as to the copying capabilities of one of Dallmeyer's lenses which he had been trying: the caricature on the table was a specimen. He also begged an inspection of Mr. Noton's very ingenious pneumatic plate-holder, one of which was on the table.

A miscellaneous conversation ensued, after which it was announced by the Chairman that the Committee had made arrangements with the General Committee for a Photographic Exhibition, to be held on the occasion of the visit of the British Association, in August next. A sum of money had been granted for that purpose. One of the best rooms in the Royal Institution had been obtained, and, with the time and money they had at command, he did not doubt that they would be able to get up an Exhibition superior to anything of the kind which had preceded it. He suggested to the members the desirability of their taking improved views of places of interest in the neighbourhood.

Birmingham Photographic Society.

The ordinary monthly meeting of this Society was held at the Odd Fellows' Hall, Temple Street, on Tuesday, the 30th ult., W. B. Osborne, Esq., Vice-President, in the chair.

After some miscellaneous business, and the exhibition of several specimens, a discussion on lenses was resumed, and much interesting information elicited.

Mr. Turner produced three portraits, the negatives of which he stated were taken by one of Lerebour's small lenses. He stated that he found the Lerebour lens to work better than any other he could obtain, as it would cover a large picture equally with a smaller one, without any distortion or weakness towards the edges.

The Chairman said that, in the paper which Dr. Anthony had favoured them by reading at their last meeting, he had remarked that a stop placed in front of a lens caused the aberration to be of such a nature that straight parallel lines were rendered as curved towards each other, and produced the so-called "barrel" shape; while, if the stop were placed behind the lens, the rays crossed after passing through, and produced an aberration in an opposite direction called "pin-cushion," the lines being bowed from each other. He should like to know how the Doctor proposed to remedy this?

Dr. Anthony said that Dallmeyer's triplet lens was constructed with a negative lens between the others, for the purpose of avoiding both the "pin-cushion" and "barrel" distortions; but, to reduce the distortion to a minimum in a single lens, the object was to cause the eccentric pencils to fall upon the circumference, instead of the direct or central pencils, never forgetting that in placing the stop, and regulating the aperture of that stop, the photographer had to deal with a cone of light and not with parallel rays.

The Chairman said that many opticians made the stops in their lenses immovable. He had himself a landscape lens in which the stop was fixed.

Dr. Anthony said he had, a few days ago, been speaking on that subject with Mr. Ackland, who acknowledged to him that in every case the stop ought to be movable. Makers, however, placed the stop in what they thought the best average position; as, if moveable, amateurs would be almost certain to place them in the worst position possible, and then write angry letters to say that the lenses sold to them would not work. He believed that for those who wished to work with care, and who had a knowledge of the subject, the stop ought to be moveable, both in landscape and portrait lenses. Since the meeting of March 26th, he (Dr. Anthony), with the assistance of Mr. Brown (the Honorary Secretary of the Society), had made a series of experiments for the purpose of testing the lenses of different makers, the negatives of which were produced, as he thought they would be more satisfactory evidence than the prints from them of the working of the lenses. These negatives being all taken on the same day, with the same chemicals, and with the camera in the same position, were considered to be a very fair comparison. His house, an old-fashioned residence, broken up by gables, offered an excellent object, not only from the large number of planes it presented, but also from the position of his vinery, the latter of which was about central between the house and the camera. The point of view selected was some seventy feet distant from the main buildings, and from this place the whole of the pictures were taken. Their chief object had been to see how far they could get the vinery and house into focus at the same time. The first was taken by Dallmeyer's triplet, eighteen-inch focus, exposure thirty seconds, without sun. This plate gave an excellent definition of the image up to the extreme edges, and was especially remarkable for the absence of all distortion in the perpendicular lines, so fruitful a source of annoyance in architectural subjects generally. The second, by a Petzval lens, focal length twelve inches, exposure twenty seconds, the sun being out bright, gave a definition of the *central* portion equal to the triplet, but with a tendency to *curvature* in the outer lines. The third, by Voigtländer's single lens, seventeen inches focal length, was exposed, in sunshine, sixty seconds, producing a sharp clear picture in the centre, but falling off materially towards the edges. The fourth was from a Grubb's four-inch aplanatic lens, twelve-inch focus, time of exposure, with sun, ten seconds, which gave a very much diminished image, but included, of course, a much *larger angle* than any of the preceding ones: the definition up to the edges of the plate was good, but a slight curvature was observable. The fifth, was by a Hermagi's portrait combination: this picture was an instantaneous one, with sun, and showed the powers of the lens to be very great, defining with equal clearness a figure against the vinery, thirty-five feet at least from the camera, and buildings at more than double that distance; the outer edges of the plate were not so clearly defined as could be wished, but the lens was evidently overtasked. The sixth, a portrait from Dallmeyer's triplet, with the central or negative combination removed, was exposed in the open air four seconds; but, being taken towards evening, shows a falling off in the actinic power of the light, and at the same time shows also that the triplet is scarcely available for portrait purposes, and *ought not* to be so applied except under extraordinary circumstances. The various negatives were separately and critically examined with much interest, and there seemed an unanimous opinion that Dallmeyer's triplet, from its rendering the lines of architectural subjects, especially, perfectly true and perpendicular and entirely free from distortion, was far superior to either of the others. Although the specimen produced did not show so large an amount of illumination as the others gave, still the detail was equally sharp, and as clearly defined at the edges as the centre.

Mr. Plante asked what form of lens Dr. Anthony thought best suited for enlarging purposes?

Dr. Anthony stated that for enlarging negatives he had never met with any single lens that gave him perfect satisfaction. In a negative of stereoscopic size there was often a great deal of beautiful detail, which rendered it very desirable for taking an enlarged picture; but neither Voigtländer's, Ross's, or Dallmeyer's lenses would bring out the detail with the distinctness that he desired, for directly the copy passed the size of the original, it began to fall off most fearfully about the edges. For copying such pictures it was better, instead of trying to do too much at once, to take a positive only a little larger than the original negative, and then again copying that, and so on for several times. By so doing they would get a negative that would print beautifully, and show no distortion. Instead of using a single lens in such cases he used a portrait combination, with the stop placed close down before the front lens: by that means the size of the picture was limited, but it was made particularly soft.

Mr. Turner said that would make it like the Lerebour lens, in which the stop was always before the front lens.

Dr. Anthony said that placing a stop in front of a portrait combination, though it had been the custom, was about the worst possible position; because, though a stop in front produced a better definition at the sides of the picture, and so was useful for taking groups, and copying from a plane surface, yet the field was found to be much diminished; the time of exposure to be nearly, if not quite double, that with a *central* stop; and, as Lake Price had correctly stated in his *Manual of Photographic Manipulation*, "the stop in front of the lens gives a *flatter* picture, but placed between gives a larger picture, with more depth of focus in the centre." A smaller stop does not always improve the definition, and beyond a certain point would rather tend to injure it.

Mr. Turner stated that he found the Lerebour arrangement to work very well in taking portraits, and especially if taking a group.

Dr. Anthony: As I before said, for groups the stops would be better in front, as it thereby corrects in some measure the curvature of the field, but at the expense of a diminution in size.

On the subject of Grubb's lenses, Dr. Anthony stated that he had found Grubb's landscape lens to take in a very much larger angle than any other—indeed, that quality might be seen in the very fine photograph on waxed-paper (Conway Castle) sent for exhibition by Mr. Robertson, of Manchester; but, at the same time, he must say that with a test he was in the habit of using, viz., some fine wire lattice in a dairy window, he could not get as satisfactory a definition with a Grubb as with his other lenses.

[The report of this and the Manchester Society, are condensed from the official organ of these societies.]

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 15th May, 1861.

M. Ferrier, whose stereoscopic views have for so long a period been the admiration of the world, has effected an improvement in taking instantaneous pictures which may be pronounced truly remarkable. At the last meeting of our Photographic Society this artist exhibited some stereoscopic pictures of singular excellence. One representing a boulevard of Paris, at a time when it is most crowded with fashion; horses, carriages, and pedestrians in continuous motion are represented as clearly and perfectly as if they were taken while at rest. This result M. Ferrier arrives at by adding a little *formic acid* to the developing solution of protosulphate of iron. The accelerating power of formic acid had been previously established in the use of the bath of nitrate of lead, in which a small quantity of this acid was accidently formed. Taupenot plates prepared in this bath required only one-third of the ordinary time of exposure, but the pictures had not the desired solidity which characterizes those of M. Ferrier now exhibited. I should not omit to state that these remarkable views were taken with Mr. Dallmeyer's new stereoscopic lens.

By acting upon sugar of milk with bromine, and decomposing the bromide so obtained with oxide of silver, Dr. Barth has discovered a new acid analogous to saccharic acid.

The recent researches of Bunsen upon coloured flames have suggested to M. G. Merz to study the colorations produced in flames by many substances, in order to arrive at a generalization in the employment of these colorations in qualitative analysis. The substances with which he experimented were nitric and and nitrous acids, phosphoric, sulphuric, boric, and chromic acids, potash, soda, lithium, barytes, strontium, chloride of copper; the results of his experiments were satisfactory and conclusive, and leave no doubt that analysis will be enriched with new resources by this method.

Signior Giovannetti has sent to our Photographic Society some positive proofs obtained in writing and printing inks, by a new process of which he has not yet supplied any details. The specimens have the aspect of proofs obtained by the salts of silver. If this process should prove practicable, it would not be rash to predict "another revolution in photography." We must await the discoverer's pleasure for the particulars.

M. Lavigne, who has made the subject of toning baths his special study, prefers to use such as consist of chloride of gold and hyposulphite of soda. The gold without the hyposulphite yields very rich tones; but M. Lavigne recommends particularly, when adopting this method, to employ the following formula:—

Chloride of gold and potassium	15 grains
Chloride of sodium	150 grains
Water	7 pints

Some experiments, undertaken by M. Van Mônckhoven, lead him to conclude that the sensibility of iodide of silver to light is greatly modified by the presence of other substances. His suggestions will open a new field for research from which important results to photography may be expected.

Doubtless many of your readers are engaged in the cultivation of the potatoe. Many remedies have been proposed for the disease with which this valuable plant has been afflicted since 1847; their use has been attended with more or less success. M. Martellière suggests the following, as a simple and efficacious means of preserving the potatoe plant from disease. Immediately the plants are in full blossom, say about the middle of August, a flock of sheep are turned into the field to pasture; at first, for a couple of hours a day, then for one hour, and afterwards for half an hour a day, until the end of the month: and again a few times during the month of September. The shepherd must keep the flock moving about the field, so as to operate equally. About an hundred sheep are sufficient for ten acres of potatoes. In gardens, the potatoes must be manured with sheep's dung. This method has been tried for five successive years, with invariable success. On those fields to which the sheep were not admitted, the potatoes were all attacked with the disease.

The Abbé Laborde has observed a new and important property of phosphorus, the knowledge of which may prevent many serious accidents in the manipulation of this combustible.

Take a stick of phosphorus, quite dry, and scrape it with the blade of a knife, so as to detach some fragments, and collect them on a sheet of paper. So long as they remain detached from each other they do not alter their appearance, but the instant they are brought into contact they suddenly melt, and undergo a semi-fusion; the temperature rises, and sometimes inflame spontaneously.

If instead of detaching the light fragments of phosphorus a thin slice is cut off, in a few moments the edges melt, and if the fusion is rapid, spontaneous inflammation becomes imminent.

THE TANNIN PROCESS.

Sir,—In the descriptions of the tannin process, hitherto published, I have not read of any other solvent than water being employed to moisten the film before development; I have developed six negatives (stereo) without any appearance of a wrinkle, or slipping of the film; by first wetting the film with diluted spirit, and rinsing it off with plain water (to prevent oily lines) it appears to me that the spirit effects a rapid solution of the tannin, and thus prevents the swelling effect, and consequent lifting of the film. I have used methylated spirit 1 part, water 5 parts. Hot water in place of cold, it seems to me may have a like effect.—I am sir, yours respectfully, Wm. Bartholomew.

Fareham, May 11th, 1861.

Photographic Notes and Queries.

Difficulties in Albumizing Paper.

Dear Sir,—I have been trying to albumenize paper, but do what I will I cannot get the albumen to dry equally on the surface—streaks of a dark brown shade showing themselves on the finished proof. Can you help me in this difficulty, or tell me how commercial albumenizers manage to overcome it.

I will briefly detail to you how I proceed. To the whites of 15 eggs I add 5 ounces of water and a few drops liquor ammonia, beat into a froth, skim off as it forms, and put into a flat dish to subside; after standing a week filter into another dish for use; float one minute, pin up by *two corners* to a piece of tape stretched tightly along a wall. I have also tried pinning up by one corner, and every other method I could devise, but always the same result—*inequality*.

Perhaps I should succeed better could I albumenize a whole sheet at a time, instead of pieces of the size on which this is written.—Yours, &c., R. E. M

[We cannot say with certainty the cause of the streaks to which you refer. Mr. C. Jabez Hughes, who has devoted much time and attention to the subject, attributes them solely to defects in the paper, which is unequally absorbent. Mr. Sutton states that a little acetic acid added to the albumen will cure the evil. We cannot say with certainty what plan is adopted by professional albumenizers; but we believe that many of them use acetic acid. Try it; and in any case omit the ammonia. Ed.]

Moule's Photogen.

Sir,—In your last week's journal you inserted a report of the Newcastle Society, containing the substance of a letter sent them by Mr. Moule, wherein he states that 300,000 portraits had been taken during the past season. This number would require between 40 and 50 tons of composition. From my knowledge of night portraits, and the number of those that are taking them, together with the want of confidence on the part of the public to have them, I am induced to believe your reporter has been mistaken in the figures, which would be most likely (if not corrected) to mislead many of the poor photos,—trusting to your usual courtesy for my excuse, I am sir, your your obedient servant, H. W.

London, May 15th, 1861.

[Our details were received direct from the society, and are, we believe, correct, so far as the society is concerned. If there be any error, we conceive that it may inadvertently have crept into Mr. Moule's letter. We will call his attention to the matter, when he will doubtless be happy to explain or confirm the statement.—Ed.]

TRANSFERRING COLLODION POSITIVES TO PAPER.

A new process, superior to leather, enamelled cloth, &c., for certainty, beauty of picture, and ease of manipulation, is the following:—

Take of india-rubber, such as is used for belting, one ounce, and dissolve it in two ounces of camphine. Take three ounces of asphaltum and dissolve, by gentle heat, in six ounces of turpentine and eight ounces of boiled oil; when it is all dissolved, add the dissolved rubber. After letting stand a few days to settle, decant into a flat dish and float your paper (common letter-paper is as good as any) upon it, hanging up by the corner to dry. Repeat the process until you have a smooth surface. If the solution is too thick, add turpentine and boiled oil in the ratio of six of the one to eight of the other. Keep the paper free from dust and it will keep any length of time.

After taking your picture and drying it, pour on alcohol, slightly acidified with nitric acid, say three drops of acid to one ounce of alcohol, letting it rest while you coat your paper in the same way: drain off into the bottle for future use. Then, with the plate in one hand and the paper in the other, dip in clear soft water several times, after which, lay the plate on the table, collodion side up, and put your paper upon it, rubbing it gently to free it from air-bubbles and superfluous fluids; when smooth, it is ready to be taken from the plate, be the time more or less; dry and mount. Thick collodion is better for transferring than thin.—*Humphrey's Journal.*

A new photo-lithographic process has been patented in France. It is invented by an English gentleman residing in Brussels, Mr. Wm. Toovey, brother of the water-colour artist. The photograph is produced at once on the stone without any intermediate operations. Full particulars are not yet announced.

Talk in the Studio.

Photography and Physiology.—An important scientific work is in course of issue in Munich—a Photographic Atlas of the Nervous System of the Human Frame. The photographs are taken by Herr Albert, the Court photographer, and are done with clearness and precision. There is an explanation published with the plates, in German and French, by a Professor of Anatomy; and the work is to be completed in ten parts, each part containing five plates, and costing about 11s. 6d. The first part is published, containing the nerves of the head, which stand out as plain and as fine as a spider's web in the photograph. The importance of such a work for students of anatomy can hardly be exaggerated; and, as I believe nothing of the kind is already in existence, it is a great honour to Munich to have led the way.—*Athenæum.*

Photography in the Witness Box.—Photography has frequently been called upon as an unerring witness in law cases, both civil and criminal. A case which recently came under our notice called into exercise an amount of decision and promptness in emergency that rather reminds one of a clever piece of military strategy than anything else. A case for compensation was under the attention of the Vice Chancellor's Court, in which a gentleman represented that his little rural paradise, a romantic and beautiful retreat from a noisy and irreverent world, had its sacred quiet invaded and destroyed by the immediate proximity of a railway. This retreat, which was, we understand, little better than a barn, was painted in glowing colours in the affidavit of the plaintiff. To show the real facts, defendants were anxious to have a photograph of the cottage to bring before the Court; but the plaintiff had stoutly resisted this, and kept watch that no photograph should be taken. At the last moment, the night before the case came on for hearing, application was made to one of our correspondents to take a view by strategy, and have a print in Court by ten o'clock the following morning. Nothing daunted by the difficulties and short time, he undertook the commission. The next morning was perhaps the most anti-photographic of the whole year: fog, snow, and rain. He arrived at the spot, some miles from his home, at seven in the morning, when it was barely light. During the night a couple of "navvies" placed at his disposal by the railway Company, had erected a rude platform to allow the camera to peep over a high wall, with which the house was surrounded. By his direction they tied back such boughs of trees as were in the way, and all was got into order whilst the unsuspecting plaintiff and his household slept. Everything was made to look as orderly as possible again, and a Fothergill plate being placed in the camera was exposed for one hour. It was then developed in a tent on the spot and found all right, and was dried and varnished. A sheet of paper was then sensitized in the tent, and placed with the negative in the printing frame, which was tied upon the top of the cab to print, and the driver told to drive to court like mad some half-dozen miles off. On reaching court the print was sufficiently done, and was mounted by means of four wafers on a piece of card-board, and curtained with a piece of yellow paper, being unfixed. It was ready we believe just two minutes before the time. Its effect in the court we did not hear, but it ought to have been successful, simply as a reward to promptness and skill.

Photography and the Art Critics.—It affords us intense satisfaction at all times to watch and record the gradual, but sure progress which photography is making in establishing its ground for consideration amongst the Art Critics. The *Athenæum* in a notice of the Exhibition of the Royal Academy just opened, speaking of a painting of the "The Ruins of the Temple of the Sun at Baalbec," by David Roberts, the acknowledged prince of architectural painting, compares photography favourably as contrasted with the picture, and remarks: "It is not to be denied that there is a certain mechanical grandeur in this picture; but as to its affording anything like a literal and faithful representation of the subject whose name it bears, the idea is preposterous. The columns and temples *may* occupy such and such positions, singly and relatively; but, out of so mechanical and artless a representation, it is hopeless to get any idea of those feelings of desolation, voidance and ruin which the place itself never fails to call up. We have seen photographs which were awfully grand in comparison—indeed, were really so, because they gave us the city that has stood amidst sands for a thousand years or more."

To Correspondents.

J. A. Glo.—The yellow spots in your print appear to arise from imperfect fixation. The hypo has been too weak or too old, or too many prints have been immersed at once. The spots appear to consist of the insoluble hyposulphite of silver. In other respects the print is a very good specimen of the process. A little longer exposure would have brought out all the detail in the foliage, and made the negative all that could be desired.

A Female Artist.—The cost of protection by registration varies somewhat according to the article to be registered. Provisional registration costs, we believe, from about £3 to £5. A patent agent will supply you with full information. Write to B. Browne and Co., patent agents, 52, King William Street, E.C. The reduction for a quarter's advertisements will be ten per cent.

C. Barker.—The lines in your negative arise from the action of light upon the nitrate of silver running in greasy lines down the plate. The light is refracted by the streams of solution. See Mr. Thomas's article on streaks, in the present number, and our own remarks on the subject. We do not think yours a common form of streaking, but Mr. Thomas's suggestion meets the case.

Colby.—The best "optical glass" for lenses, is made by Chance, of Birmingham. Mr. Hughes's work is just out, and the price is one shilling.

J. F.—You will find a method of transferring collodion positives in the present number, and various processes have been given from time to time in our columns. One of the simplest methods is as follows:—Dry the picture, and then pour on and off two or three times a little alcohol and nitric acid, about ten drops of the latter to an ounce of the former. Then treat a piece of black glazed leather in a similar manner, whilst the surfaces are wet; press them closely together, taking care to exclude air bubbles. Now place them in a pressure-frame for about half an hour. At the end of that time the leather may be lifted from the glass, and will bring with it the film. A tough collodion of good body should be used.

N. W.—If you adopt Mr. Barber's plan of purifying the silver bath by means of oxide of silver, the bath after filtration will generally be found slightly alkaline, from a minute portion of oxide of silver in solution. The addition of acetic acid will now by combination with the oxide, form acetate of silver, and thus produce the conditions laid down as necessary for Ponting's collodion. You may frequently use the recrystallized silver sold as pure, but you cannot be absolutely certain. Results are the only reliable guide.

M. N. B.—Print a little deeper and remove the prints from the toning bath before they have acquired the cold blue tone. Your negative is scarcely sufficiently vigorous to give the best results. The stain is the result of handling the excited paper with fingers which had been in hypo. You must be cleanly and careful if you would succeed in photography.

W. L.—We are much pleased with your specimens. The performance of your lens is very satisfactory. We will insert your name.

L. A. D.—Your picture is not quite sharp, but it is in other respects very good. We have not had experience in using the hot press; but may state that the face of the picture should be next the hot plate, and nothing soft need be placed between it and the roller.

C. C., Belgium.—It is difficult to advise you as to price, as it is a point of which you are the best judge. We should say about 2s. 6d. or 3s 6d. It will be better to send them mounted, but not glazed under the circumstances.

Michael L.—The specimens are very respectable and decidedly indicate progress. But they are sulphur toned. Why don't you try the alkaline gold bath?

Clayton.—The picture should not be fixed, but developed with iron, well washed, the iodine solution applied, again washed, and then intensified with pyro and silver. If you simply apply the iodine solution without further intensifying with pyro and silver, you convert the deposit already there into iodide of silver, which is very readily soluble in cyanide of potassium. If the image is dissolved off after you have intensified, it is because you have not intensified enough, and you use the cyanide too strong.

L.—We are obliged by your communication, and will give it early attention.

G. W. Hale.—Only your letter has arrived as yet. We will give you our opinion with pleasure when the pictures arrive.

Charles Hathsone.—Considerable confusion exists in the terminology used to describe the various qualities and strengths of acetic acid. The acetic acid of the P.L. is a little more than half the strength of the glacial acetic acid solid at 60° Fah. Beaufoy's acetic acid is a very indefinite term indeed, as Beaufoy's send out three or four different qualities of acetic acid. Their best is a little stronger than that of the P.L. We shall enter more minutely into the subject shortly, in our series of articles on "Photographic Chemicals."

W. Deane.—Bromides are added in small proportions, of generally from one fourth of a grain to a grain, in conjunction with the usual amount of the iodide, to give additional sensitiveness to the collodion when developed with iron, and to produce softness and cleanness in the picture.

W. H. N.—We have not used the collodion you name, but suspect that it is scarcely intense enough for your purpose. Expose a little longer, and continue the use of the pyro and silver longer. If you do not gain sufficient intensity wash well, and then apply a solution of bichloride of mercury; you can by this means gain any amount of intensity. The toning is scarcely deep enough; but without a more intense negative you cannot get deep tones.

D. Hills.—We do not know of any good whole plate lens for sale second hand at present, such are, however, constantly announced for sale in our advertising columns.

Herbert Ogg.—A correspondent asks us if we can give him any information of the address of this gentlemen who is a photographic colourist. If Mr. Ogg will write to us, we will forward the address.

Phos., G. S. Penny, and W. B. Fawcett, are thanked for communications which shall receive early attention.

S. F.—Considerable improvement, but still not sufficient exposure. We fear the collodion is faulty. Try some fresh. The print is a little too deeply toned.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

THE PHOTOGRAPHIC NEWS.

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SHARPNESS *versus* HARDNESS.

One of the earliest discussions which agitated the Photographic Society immediately after its establishment, and found the devotees of art, and the representatives of science, arrayed against each other, arose out of a consideration of the true character and use of sharpness. A discussion similar in character, but in a milder form, arose out of Mr. Wall's paper the other evening at the South London meeting. We cannot help thinking that the objection to sharpness on both occasions has arisen from some misapprehension of its true character. Disgusted with hard pictures which were vaunted as sharp, Sir William Newton proposed, for producing certain artistic studies, to turn the lens a little out of focus. In the absence of the softness produced by true gradation, he would prefer the bastard softness produced by blurring the lines of the picture. To the painter, this idea might naturally arise, as suggested by the manipulations of his own art, in which the sharp hard lines of the pencil are "softened" by blending them with the badger-hair "softener." The nature of the tools and of the results in the two Arts are, however, essentially different. The perfect gradation of a well lighted object, as given by a good lens on the ground glass, is immeasurably softer and more beautiful than the finest picture which can be produced by the pencil; and if that image be faithfully reproduced in the picture, it needs no touch of the badger tool to satisfy the most artistic eye. If it did it is very apparent putting the lens out of focus would not really soften the picture, but spoil it. As M. Claudet at the time remarked, "If we push the tube out, the parts before the face will be more confused than they were before; and if on the other hand we push it in, the parts behind will be more confused than they were before. The difference will be incongruous in both cases, either for the nearer or for the more distant parts. The confusion in these parts will be such that the drawing will be false, and the outline deficient."

In the discussion the other evening, Mr. Wall did not propose to get rid of sharpness. He admitted that he had disliked the word, that he had decried it, and had both publicly and privately called it hard names; but when he had now carefully set himself to the enquiry "what is it?" he began to suspect that it was after all an old friend of his, and which in his pictures he would not willingly lose. The true culprit was hardness, but he had so often heard hard pictures praised for sharpness, that he had come to regard the two terms as almost synonymous; and he could not readily bring himself to believe that a large majority of photographers did not entertain similar error, and quoted various photographic authorities in favour of his opinion. Lake Price, for instance, condemns the "parrotry of sharpness." But it should be observed here that Lake Price does not condemn sharpness, but the "parrotry" regarding it: that is the unintelligent and unappreciative use of the term; and the perpetual lauding of it as a substitute for all other artistic qualities.

That it is possible to sacrifice almost every other artistic quality to something which shall be called sharpness, there can be no doubt. We can recall to our mind at this moment portraits taken with the full aperture of a lens of short focus placed nearly close to the sitter. The huge Cyclopean eye of the lens looks not only at, but over, and under, and all round, every inequality in the texture of the skin. And instead of giving an image such as the human eye would see, it yields a monstrosity, in which the velvetty skin is as rugose as the hide of a rhinoceros. And yet the first impression conveyed to many minds is one of amazing sharpness, and the pictures get praised for that quality. We have again seen pictures of essentially opposite character. We have seen landscapes and bird's-eye views of towns in which by the use of the smallest possible of stops, sharpness was distributed over miles of space: flat, hard, adhesive pictures, in which the parts had no separation or relief, the extreme distance being glued fast to the foreground; atmosphere was ignored, and the picture of miles of space presented no relief whatever, the effect being similar to that produced by looking at the scene with one eye, and that through an aperture little larger than a pin head. Such pictures also have been praised for sharpness. We have also seen pictures without any of these enormities, perfect enough in proportion, but possessing only a few keen microscopically sharp lines of black and white, without the slightest gradation of tone or detail, and these also have been praised for sharpness; we presume, in deference to their sharp contrasts, if to nothing else. We can understand therefore, that Mr. Wall, looking at the matter purely from the stand-point of the artist, should have been ready to decry this quality, which amongst certain photographic critics has often been made to do duty for so much else. We have heard an ill-natured remark, to the effect that when a young lady is described as being amiable, it is a sure sign that she is neither clever nor beautiful. Following the same idea, it has been too common a criterion of the absence of artistic qualities when a picture has been praised for sharpness.

It would be as absurd, however, to regard sharpness as a bad quality in a picture, as to regard amiability as a disagreeable characteristic in a lady, simply because they each, amongst a certain class of critics, have been made to do duty for other qualities; and we cordially endorse the remarks of Mr. Hughes in which he regards sharpness, that is, perfect definition, as one of the primary and most vital essentials of a good photograph. Indeed, in a certain sense, we are disposed to regard perfect sharpness as absolutely essential to, if not entirely identical with, perfect softness. Perfect delicacy of gradation is necessary to softness; and entire sharpness is, to our apprehension, necessary to delicacy of gradation. The sharper or more perfect the definition, the finer the lines or points; and the finer the lines or points the greater the number of them in a given space; and the greater the number of lines or points of varying luminosity, the more perfect the gradation, and, of course, the softness. Take a carpet, or any other textile fabric, as an illustration. The finer the threads the more soft and perfect the gradation in the pattern. Every school girl knows that the finer her canvas and thread, the more delicate become the patterns of her embroidery. Sharpness is, therefore, as Mr. Howard stated, an absolute necessity of anything like perfection in small pictures.

We are not about to discuss here whether we should adopt the principle of securing microscopic delineation on a mathematical plane and over a limited field, or whether an inappreciable amount of astigmatism may not be tolerated in order to secure other advantages. We are merely asserting that sharpness is not antagonistic to artistic qualities, but rather essential to their full development. The works of all our best photographers might be adduced in illustration; but we will content ourselves by referring to two. In portraiture we believe it is universally acknowledged that the vignette heads of Mr. T. R. Williams, are unequalled or unsurpassed by the productions of any other photographer. Yet it will be at once admitted, on examination, that they are amongst the sharpest, as well as the softest specimens of our art. In landscapes, we know of nothing surpassing the pictures of Mr. Mudd: take Coniston Falls, a picture now familiar to many photographers. In it we have gradation after gradation of distance, all perfectly defined; but without the slightest degree ignoring relief or atmosphere. After the effect of linear perspective the all-important element in giving true effect to distance, in a landscape, is atmosphere, by the influence of which light and shade and colour all lose their contrasts, and details cease to be made out: forms are not, however, altered; they are still defined, however faintly: there is neither distortion nor the blurring of imperfect focus; and when the latter qualities are present in the photograph they are blemishes not beauties. The artistic photographer will always preserve his chief focus, both definition and of light—using "focus" in an artistic sense—for the principal object in his picture, but he will aim at getting due definition everywhere. He will aim at obtaining sharpness; but in the right place, and distributed in its proper relations throughout the picture.

INSTANTANEOUS PHOTOGRAPHY.

Dallmeyer's Stereoscopic Lenses.

Amongst the most notable photographs figuring in the present French Exhibition are some remarkable instantaneous pictures by Messrs Ferrier (father and sons) and Soulier. They are described by *Le Moniteur de la Photographie*, as the most perfect things of the kind ever produced; and from their subjects necessarily involve the conditions of complete instantaneity to obtain any degree of success.

They consist chiefly of views of one of the most crowded Parisian thoroughfares, the Boulevard de Sebastopol. Not one of a thousand figures of all kinds, foot passengers and vehicles passing in all directions, shows the slightest sign of movement or imperfect definition. Figures standing in the shadows of porticoes are all perfectly rendered, although the exposure was but the imperceptible fraction of a second. To produce these pictures the lenses have been procured from England—Mr. Dallmeyer's stereoscopic lenses having been selected. *Le Moniteur* reporting upon them says:—

"Messrs. Ferrier and Soulier have made numerous experiments with these instruments, and have communicated to us the results.

"These artistes have proved that these lenses give a more luminous image than any instrument made up to the present time, that without any diaphragm they give a large field rigorously clear and well defined, that the image is quite free from aberration of perspection and nearly so from aberration of sphericity. This last, when at all apparent, is in the opposite direction to that seen in lenses generally; but in the present instance the defect is so slight, that it may be considered as *nil*. With a diaphragm the image is quite perfect.

"The short focus enables the operator to work with the greatest rapidity, and also permits him to photograph objects from which it would often be impossible to retire sufficiently far distant with a lens of long focus.

"The apparatus is so arranged that the front lens of the combination may be used as an ordinary single view lens, which gives excellent results for landscape work, with a stop of one centimetre, or a little more than three-eighths of an inch.

"It is with the stereoscopic objective of Mr. Dallmeyer that Messrs. Ferrier and Soulier have executed the greater part of the remarkable instantaneous pictures described in another column."

We feel gratified that a firm, so celebrated for the excellence of their stereoscopic results as Messrs. Ferrier and Soulier, should send from Paris for the instruments of an English optician, and should so ungrudgingly accord their high meed of praise to them; and we feel additional gratification that our opinion, more than once expressed, of the value of these lenses, should receive such satisfactory endorsement.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Clair-obscure.—A French term, the meaning of which is the same as chiaroscuro, for which it is frequently used.

Classic.—The great works of ancient art are termed classical, but the term is also applied to the best productions of really great modern masters. The word is said to have been derived from the term *classicus*, which originally meant the higher order of citizens.

Clearness.—A quality more frequently applied to the harmony of colouring; but of importance as affecting the harmony of tones, and the proper effect of atmosphere. Clearness is a quality of the picturesque which is so much a matter of feeling with artists, that when asked to define it they are generally somewhat at a loss, and can more readily tell you what destroys it, than what constitutes its being. The most essential elements of clearness are gradation, force, and breadth of chiaroscuro. The most powerful of its destroyers are a want of gradation and the absence of atmospherical effect. The photographer's white sky, by rendering every gradation of tone in the picture false both to nature and art, strikes clearness dead at once; and so does large, unbroken masses of light or dark when of an even monotonous tone. J. B. Pyne, in a series of practical articles which were very highly appreciated by artists, and which appeared in the *Art Journal*, under the title of "The Nomenclature of Pictorial Art," says, "The quality of clearness at its maximum results from the coincidence of a full harmony of colour, in very moderate force—*aerial perspective*—a frequent alternation of the transparent, semi-transparent, and opaque media,* *distinct detail, and bold chiaroscuro.*

Close.—A view shut in by trees, or which gives but little distance, is termed a close view. Such have been more frequently successfully rendered by photography than views representing greater varieties of distance.

Composition.—The composition of a picture indicates the conception of the artist, and, as a whole, must be regarded as the exponent of his sentiments and feelings. By it we are instructed to consider the character of every portion in reference to unity,† harmony, and keeping; so that no part of the picture can refuse to co-operate with every other part, in conveying to the spectator's mind the feelings by which the artist was influenced in his selection and treatment of the subject represented. Composition may be held to take in every branch of study connected with the picture's progress, and all the rules and principles I have, or shall endeavour to enforce are, strictly speaking, part and parcel thereof; but in its higher sense it is more closely connected with the painter's loftier aspirations to which all these are but as means to an end.

In one of my earlier papers, "From a Photographer's Common-Place Book," I took occasion to point out the difference between the artistic and the photographic meaning of this word; and my very excellent and able friend, Mr. Hughes, in a paper read before the South London Society, also pointed out the mischievous tendency which the misapplication of such a term had when applied to artistic photography. Composition implies that every part of a picture is associated with the whole. This must not be overlooked when the objects you are photographing are examined upon the focussing glass. They should be

* These papers were, of course, addressed to the painter only. The italics indicate those qualities which have a photographic bearing.

† "Composition implies the putting together of parts so as to constitute a whole; but the parts or divisions must be distinct, or there will be no apparent composition."—H. Howard, R.A.

chosen, rejected, or altered in appearance, by a change of position, solely in reference to the feeling, sentiment, or thought you desire to express.

Of course if your only aim be imitation without selection, or selection with a view to mere common place photography, composition, like nearly every other artistic principle of rule, will be of small use to you. But if you select a view which speaks to your own mind of poetical sentiments, lofty ideas, or particular beauties, associated with certain trains of thought, and desire to embody these in your finished picture, you will then begin to analyse the scene and discover the peculiar features thereof to which such effects may be more clearly attributed. Then you will turn to the focussing glass with studious and anxious earnestness:—will not throw off the dark cloth and pull out the ground glass directly you see the image is sharp; but will carefully consider it in regard to composition. Taking both the intended size and shape of your picture into consideration, with a view to *excluding* anything that might exhibit characteristics at variance with your aim or design; and *including* everything of value to the same.

A picture so produced has given, as it were, new life and speech to a portion of the artist's soul; for his living thoughts are so embodied therein, that they commune with all who see them.

Ruskin says,* "The landscape painter must always have two great and distinct ends; the first, to induce in the spectator's mind the faithful conception of any natural object whatever; the second, to guide the spectator's mind to those objects most worthy of its contemplation, and to inform him of the thoughts and feelings with which these were regarded by the artist himself.

"In attaining the first end, the painter only places the spectator where he stands himself; he sets before him the landscape and leaves him. The spectator is alone, he may follow out his own thoughts as he would in the natural solitude, or he may remain untouched, unreflecting, and regardless, as his disposition may incline him. But he has nothing of thought given to him, no new ideas, no unknown feelings, forced on his attention or his heart. * * * But in attaining the second end, the artist not only *places* the spectator, but *talks* to him; makes him a sharer in his own strong feelings and quick thoughts; hurries him away in his own enthusiasm; guides him to all that is beautiful, snatches him from all that is base, and leaves him more than delighted, ennobled, and instructed."

Now that these eloquent remarks are applicable to camera-art, although not so comprehensively as to the painter's, will, I think, be acknowledged by photographers who have thoughtfully followed me through these papers. The truthful rendering of nature is a question which mainly concerns the photographer's manipulation, management of lens, and chemical knowledge; subject, of course, to a rightful conception of what really constitutes truthfulness. But for "guiding the spectator's mind to those objects most worthy of its consideration," we can but look to the intellectual powers of the operator as an artist.

It does not affect the question to point out the different nature of the artist's appliances and the photographer's; because although the latter must translate composition by pure selection we see too many paintings which, while admitted to be photographically true to individual nature, begat some of the brightest thoughts which have emanated from the loftiest minds among our art critics.

In the work quoted above Ruskin, says:—"The simple statement of the truths of nature must in itself be pleasing to every order of mind, because every truth of nature is more or less beautiful; and if there be a just and right selection of the more important of these truths, the facts so selected must, in some degree, be delightful to all, and their values appreciable by all; more or less, indeed, as their senses and instinct have been rendered more or less acute, and accurate by use and study; but in some degree by all, and in the same way by all."

And again, he says, speaking of selection:—"Nature's finest touches must be watched for; her most perfect passages of beauty are most evanescent. She is constantly doing something beautiful for us, but it is something she has not done before and will not do again; some exhibition of her general powers in particular circumstances which, if we do not catch at the instant it is passing, will not be repeated for us."

The above conveys a valuable hint.

The great element of all good composition lies in the power you have of imbuing with your own thoughts and feelings the otherwise inanimate and meanly useful photograph. No matter how the true artist communicates with us, whether by voice, pen, or pencil, he always knows that it is only that which he himself feels, which enables him to reach the feelings of others.

All I have written has been to show the command you, as a photographer, have over "composition," as understood by the painter. In pointing out the various means of securing effects, and their power and importance when secured, I have had, and shall continue to have, one object, viz., "composition." And now I will quit this definition, by pointing out how all the means here described are but tools to compose with, and that the aim and end of composition may be defined as the eloquent and powerful expression and preservation of all that is intellectual, noble, and beautiful in your own nature.

* In "Modern Painters."

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Chloride of Gold—continued.—The analysis of this expensive chemical is a point of great importance to all who are in the habit of purchasing much of it. It seems to be a law that the more expensive an article is the more shamefully it should be adulterated; and certainly chloride of gold appears to be no exception to this rule. A short time ago (see No. 123) we published some remarks by Mr. Reynolds on the amount to which this article was adulterated, in which he showed that in some cases the purchaser was defrauded to the extent of £23 8s. on every £100 worth sold, and adulterations to less degrees were very common. Fortunately there is scarcely any substance, the analysis of which presents so few points of difficulty to the unpractised manipulator, as the ascertaining the true amount of chloride of gold present in any sample, and we shall therefore proceed to give the full details of the best plan to follow in order to detect both the presence of adulteration in this chemical, and also the approximate amount of sophistication.

Chloride of gold is usually supplied in small stoppered bottles or sealed glass tubes containing (or said to contain) 15 grains of chloride. Take one of these bottles, and having removed any loose pieces of paper from the outside, weigh it carefully in a pair of scales, which should be at least sufficiently delicate to turn with a quarter of a grain. We will suppose the weight to be 32¼ grains. Now open and remove the contents to a small porcelain crucible, the weight of which is known accurately, washing out the last portions of chloride with a drop of water; dry the bottle and stopper perfectly, and weigh again. Subtract the less weight from the greater, and the difference will be the weight of the contents of the bottle. The following were the numbers obtained in an experiment of this kind:—

Weight of bottle and contents	...	32¼ grains
Weight of empty bottle	... ...	19½ „
Weight of contents	... ...	12¾ „

This showed that the dealer had defrauded the customer of 2¼ grains by short weight.

The crucible, with the contents and washings of the bottle are now to be heated carefully over a water-bath until all the moisture is driven off from the chloride. The crucible containing the dry residue is then to be removed from the water-bath and very slowly heated over a spirit-lamp, supported on a triangle of wire until chlorine has ceased to be evolved, and the contents are at a full red heat, and in a quiet state. Allow the crucible now to cool, and weigh it again when cold. The difference between the latter weight and that of the empty crucible will represent the amount of metallic gold in the chloride, supposing that it is not adulterated. Every 65·2 parts of metallic gold that is left in this way representing 100 parts of terchloride of gold, it is easy to calculate the quantity of the latter which the bottle originally contained. In the experiment above illustrated the following figures were obtained:—

Weight of empty crucible	$34\frac{1}{2}$ grains
Weight of crucible with gold ...	40 „
Weight of gold	$5\frac{1}{2}$ „

There were thus $5\frac{1}{2}$ grains of metallic gold left upon igniting $12\frac{3}{4}$ grains of the terchloride, and as according to the following rule

65·2 gold : 100 terchloride of gold :: $5\frac{1}{2}$: 8·4

it is seen that $5\frac{1}{2}$ grains of metallic gold only corresponds to 8·4 grains of terchloride, it follows that the dealer defrauded us out of 6·6 grains of terchloride of gold, instead of only $2\frac{1}{4}$ grains, as shown by the first weighing, a pretty good quantity to be fraudulently appropriated out of a fifteen-grain bottle; the difference being made up of moisture and acid.

For some years we have been urging upon photographers and dealers not to employ so deliquescent a salt as the chloride of gold, but to use in preference the *double chloride of gold and sodium.* This beautiful salt is easily prepared. Dissolve four parts of gold in nitro-hydrochloric acid, and evaporate as described in a previous chapter, dissolve the residue in eight parts of water, and add one part of pure chloride of sodium. Place the solution in an evaporating dish and evaporate half the water off, now place in a cool place and cover from dust, for it to crystallize. The double chloride will separate, on cooling, in the form of long orange yellow four-sided prisms; strain them from the mother liquor, dry, and preserve for use in a stoppered bottle. The crystals are quite permanent in the air, neither deliquescing nor efflorescing. 100 parts well crystallized in the above manner contain 49·5 parts of gold, 14·66 parts of chloride of sodium, 26·56 parts of chlorine in conjunction with the gold, and 9 parts of water.

The double chloride of gold and sodium can be readily analysed in the following way:—weigh out accurately 10 grains of the dry crystals, place these in a porcelain crucible and gently heat, gradually raising the temperature to full redness; water will be driven off at first, and then chlorine. The crucible must be kept at a full red heat for about half-an-hour, so as to make sure that all the chlorine is driven off, as this salt is not so easily decomposed as the simple chloride. When sufficiently heated, allow the crucible to cool, and then pour distilled water in. Boil the water by means of a spirit lamp, and then carefully pour it away from the metallic powder which will remain at the bottom. Fill up again with water, boil, and repeat the operation until the decanted liquid contains no chlorine when tested with nitrate of silver. In this way all the chloride of sodium is removed and the residue will be metallic gold. Now dry off the last traces of water, heat the crucible to redness for a minute, allow it to cool, and weigh. If the chloride of gold and sodium be pure, 10 grains of the crystals should leave 4·9 grains of metallic residue.

Chloride of Platinum is not of much use to the photographer, nevertheless, as this salt, as well as the corresponding palladium salt, has sometimes been used for toning positives, our account of the photographic chlorides would be incomplete were no mention to be made of them. Chloride of platinum is prepared by gently warming scraps of platinum foil or wire in a mixture of two parts nitric and three parts hydrochloric acid, care being taken not to let the liquid boil. The metal is gradually dissolved, and the solution must then be evaporated on a water bath with excess of hydrochloric acid, until it is dry. In this state chloride of platinum forms a dark brown mass, readily soluble in water. Its aqueous solution reddens litmus, has a very astringent taste, and stains the skin a brownish black. It may be analysed exactly in the same manner as the chloride of gold, and as every 100 parts of the anhydrous chloride contain 58·3 parts of platinum, the amount of impurity present can be at once calculated.

Chloride of Palladium is prepared by dissolving metallic palladium in nitro-hydrochloric acid, and evaporating in the same way as recommended for the platinum salt, but not driving off the whole of the acid. It forms a black brown fusible mass readily soluble in water, forming a deep yellowish red solution. If, however, the excess of acid be completely driven off by heat, there remains a brownish yellow crystalline mass which is only slightly soluble in water. Unlike the platinum salt, which is a terchloride, this is a protochloride, and contains in 100 parts 69·09 parts of metallic palladium. It may be analysed in the same way as the gold salt, but it requires to be kept for a considerable time at a red heat in order to drive off the last traces of the chlorine

SHARPNESS—WHAT IS IT?

If frequent use could wear out a word, where would that poor little word "sharpness" be? No quality has been more lauded, few more frequently denounced than that which has been held by photographers to be represented in this word. Sharpness has influenced the labours of our opticians, chemists, and manipulators; to its attainment far higher and more important qualities have been ruthlessly sacrificed; and it must certainly have seemed to many that if there was one thing above all others for which photography was providentially created, that one thing was sharpness.

I must admit that I don't like the word: it has become associated in my mind with hardness, and flatness, with a dull monotonous surface cut up into paltry little sections by sharp outlines, and the unpleasant and unnatural obtrusiveness of minute details. I have more than once expressed my feelings about it in the journals; have smiled with a sensation of gratified malice when it has been severely handled; have given it a vigorous dig in private conversation when I got the chance, and altogether have been anything but its friend and supporter. Having done all which I begin at length to suspect that the poor thing which has received so much ill-usage at my hands is after all a very worthy, good, and excellent friend of mine, deserving far different treatment. Not, however, being *quite* sure that my suspicions as to the character of this quality are justified, and not being the happy possessor of great scientific attainments myself, I come down to our pleasant meeting this evening with a few words about sharpness, written with the sole intention of enquiring from the scientific and experienced of our little fraternity—*what is it?*

In bringing forward this subject, however, I feel, to use the words of a friend of mine, that it is a difficult one to deal with, "because no one has ever fairly committed himself as to what sharpness really is, so that when you attempt to seize the fellow in one shape, *presto*, he assumes another denies that he ever was anything else than that he is, and protests that everybody's common sense knew him to be that." I shall presently show you that for want of a clear definition of this little work, much misunderstanding has divided artists and photographers; and to prove that the definition I ask for is not altogether so needless as some amongst us may think, I shall refer to such authorities as *Sir William Newton, Messrs. Buss and Leighton, Mr. H.*

Cooke, Mr. Rothwell, Lake Price, Professor Hunt, and Mr. Sutton; assuring you that to these I might easily have added a dozen or two more of good authorities, if I had possessed the necessary leisure to hunt out references.

I have been associated with photographers for nine or ten years, although my own *practical* experience in this delightful art dates from a more recent period. I have mingled with photographers, and discussed photography in many parts of England, and with operators of different degrees of merit, and of varied attainments in both photography, science and art; and it is from convictions thus strengthened that I feel this question of sharpness ought to be definitely settled.

The optician will, I suppose, define sharpness as "the perfect representation of a point by a point." The photographer, I know, frequently defines hardness as sharpness. And the artist is too apt to take the term for what it is worth in the dictionary, without due reference to its technical meaning.

I suppose sharpness really means the perfect definition of an object in focus. If this is true, what constitutes *perfect* definition? By what standard are we to judge its perfection? By the definition given in the image upon the healthy eye's retina, or that produced by an optical arrangement of glasses which gives the most clearly and distinctly visible view of every minute detail in the natural object? One lens will produce a sharper picture than another, and again by decreasing the aperture we can increase the sharpness; but what is the standard we are to set up for our guide in this matter? for unless we seek sharpness merely for the sake of sharpness, some standard of perfection we must or ought most certainly to possess.

It will show pretty clearly in what spirit this matter has been discussed by photographers and artists if I refer back to the first volume of the *Journal of the Photographic Society*. We there find that at the first ordinary meeting of that body, Sir William J. Newton, being both an artist and a photographer, read a paper "Upon Photography in an Artistic View, and in its relation to the Arts." In this paper its author, while regretting that photography had not then realized the truths of atmospherical perspective, pointed out, as a course for the photographer to pursue, the devising and discovering of means by which pictures might be produced "*still more minute and perfect in detail,*" without however forgetting "that his subjects are principally natural objects, powerfully acted upon by atmospheric influence." Sir William Newton wanted, in short, more "*gradation,*" and less "*flatness.*" and I think every *artist* photographer of the present day must acknowledge that this—speaking generally—is a want still to be supplied. In the course of his paper, however, Sir William observed that for the purpose of the painter only, and "*as private studies,*" a "greater breadth of effect" would be attained if the photograph were taken "*a little out of focus.*"

Now the great aim of the painter has always been to secure for his compositions that harmonious unity of parts which constitutes a perfect whole; and not only are crude spots or patches of light, dark, or colour destructive of this, but sharp edges and abrupt terminations have an equal tendency to cut up the surface into sections, and so destroy breadth, or in other words, the unity of parts: separating and dividing instead of uniting, giving you a weak little bit at a time, as it were, instead of coming down upon you at once with the whole strength of well united forces. For this reason Sir William advised the artist, or the painter, to take his photographs, as studies, "*a little out of focus.*"

Now the excellent vice-president's doing this was nothing very terrible, but it seems to have startled the whole photographic world from its propriety. In vain Sir William asserted "he had no intention of advocating the *general* use of this plan," nobody seemed to believe him; and soon after, when the subject was re-opened by two papers read respectively by Mr. J. Leighton and Mr. R. W. Buss (artists both I believe) a grand battle-royal came off in the presence of Sir Charles Eastlake, President of the Royal Academy, at the end of which matters remained much the same as they were before they commenced, so far as the actual merits of the question were concerned. Mr. Buss asserted that by throwing objects out of focus forms were rendered indistinct, the minute detail or lines destroyed, and nothing left but large masses of light, half tint and shade; and Mr. Leighton that by excess of detail you sacrificed breadth, or in other words exactly the same thing. In the discussion that ensued Sir William remarked that the artist who copied servilely "destroyed the poetry of fine art," and argued that photography by copying *servilely* could never reach "the poetry of *Nature.*" Mr. Vignoles said, the artist, the optician, and the engineer each viewed these matters in a different light: but although he himself certainly desired more artistic qualities in photographs, he "should as soon think of attempting the adjustment of his eye instead of using a veil, as of throwing the camera out of focus to obtain an effect he could produce by a variety of other means." Mr. Shadbolt referred to the strong party feeling existing on the subject, and stated that he and Sir William Newton differed in toto "as widely as light from darkness." Dr. Percy believed accuracy and minuteness of detail to be perfectly consistent with breadth of effect, and therefore denied the necessity for throwing a picture out of focus. Mr. Henry Cooke, a painter, said, "the whole question of whether photography should be a benefit or a bane as an art, hung upon the successful issue of the pending question. He thought focus a scientific rather than an artistic question, but said if one part of a picture must be sharper than another, that part should certainly contain the principal object or objects. Such was the character of this often mentioned and very animated discussion, in which beyond agreeing to disagree, little was done by those present for settling the point at issue.

In reference to the assertion of Mr. Buss. I would remark that the destruction of detail is neither more nor less than the destruction of gradation, upon which real softness and breadth to so large an extent are dependent. I cannot remove detail from any portion of a photographed surface without removing certain of the more delicate tones which unite and blend the half-tints with the highest lights. For instance, suppose I take a brush, and with indian ink lay in a broad line, the edges of which are washed softly away into the white paper on either side; if I then take two pieces of straight edged white paper, lay them one on either side of the line, and gradually bring them closer and closer, until a very fine dark line alone divides them; this line, owing to the removal of the more tender and delicate tones on either side, must then appear sharp and hard. Therefore I think Mr. Buss was mistaken in supposing "the minute detail or lines" might be destroyed with advantage, and with reference to Mr. Leighton's remark, I could easily quote expressions from a score of eminent artists of the highest rank tending to show that in their opinion the most minute perfection of detail was perfectly consistent with a broad artistic effect.

Sir William Newton's objections to the servile copying of the artist I can understand. There are matters of higher importance which should claim all an artist's efforts and time, for such therefore to sit down and copy nature servilely is waste of their precious gifts by indulging in mere mental indolence and self degradation: but surely the more nearly we approach, by a process demanding no such laborious outlay of time and work, the truths of nature, the greater chance we have to embody her spiritual meaning or poetry. Sir William himself inferred the close ties which unite the poetry of art to that of nature.

I have in my own mind some suspicions that the quality which is somewhat commonly regarded by our practical operators as sharpness, is neither more nor less than imperfect focus, or in other words, not sharpness at all. I believe that perfect sharpness or focus tends to destroy outlines, secure gradation, and give perfect modelling. I have frequently seen pictures produced by inferior lenses in which the contours of the features appeared to be bounded by outlines as clear and distinct as if they had been drawn by hand with a fine pointed pencil, an effect which has been lauded as the very perfection of sharpness, but which I nevertheless attribute to the want of that very quality. There are certainly no such outlines in nature; on the contrary, the boundary of vision glides gently from our sight, and dies softly away.

In this view of the case I fancy I am supported by one who, unlike myself, speaks not only from his observation of natural objects, but from a scientific knowledge of optics. Mr. Rothwell stated in a recent number of the *British Journal of Photography* that "he had never yet seen a photograph possessing that fine and perfect definition which he wished to see attained."

Sharpness, as at present understood, has never been very popular with our best men. Mr. Sutton, speaking of the wax paper process, said in a recent number of the *Notes* that one of the evils attendant upon the introduction of collodion was that of "exalting the quality of sharpness," and "lowering the appreciation of higher qualities."

Professor Hunt, speaking of this quality, regretted that "intense illumination was so much sought for under the idea of producing the sharpest picture," saying that although many productions were remarkable for this effect it was extremely unnatural, because, "*the human eye never sees this extraordinary sharpness of outline in nature;* upon the edges of every object there are fringes of light, which soften off their outlines, and subdue the general tone of objects, blending all harmoniously." Lake Price warmly denounced "the parrot cry of sharpness," and in short, so have very many others equally eminent. But as I have before said, it is now a question with me whether sharpness or perfect focus is really the quality thus denounced.

Certainly the artists who recommended that the lens be put a little out of focus, made a funny mistake. Sir William Newton was *not* one of these; for, as I have shown, he, in his paper, actually advised that efforts be generally directed to the obtaining "*still more minute and perfect detail;*" and I am, therefore, inclined to believe that his ideas *then* were not unlike those I express *now*. A picture out of focus is certainly blurred at the outlines, but it is not less blurred in its lights and shadows, moreover, it is flat and weak, and altogether a thoroughly inartistic affair. I do not think with Sir William that it would be good even as an artist's private study, and I am certain that while it had lost all worth as a photograph, it would be of no more value as a picture.

I have already referred to the control we have over this quality of sharpness by choice of lens, and method of using it. It is therefore of consequence to settle what part of a subject should be focussed for sharpness.

This question will be answered differently, according to the different ends aimed at. For the architect an equality of sharpness distributed over the whole picture will, of course, be most suitable. But the artist will always desire that every attractive quality of a picture should find its focus where the interest of his performance centres. In a portrait, the head, and those features especially which require the most prominence given to them, will be most illuminated, and most carefully wrought out in their details. In a group the principal figure will receive similar treatment; and in a landscape the vigour and force of chiaroscuro, as well as the expression of minute detail will naturally enough occupy the foreground.

In opposition to this how frequently do we see photographs in which, through the use of a very small diaphragm, the ear and boundary lines of the hair are as sharp and distinct as features which are more important and prominent, or a group, in which we find no more definition secured for the hero of the action represented, than for a figure which acts as the merest accessory to help the story. And in a landscape do we not frequently see that the operator has focussed for the most distant object in his view.

Sharpness should, I therefore venture to assert, be clearly separated from what would be more legitimately called hardness; should be limited in amount; and judiciously secured for that portion of a portrait, landscape, or composition group in which it will have tne most pictorial value as focus. I use the word focus here in its artistic sense.

The painter recognises the value of focus throughout his whole work. To secure breadth of light and shade he obtains a focus of light and a focus of dark, in short, all his effects invariably have their focus. But if the lights were of nearly equal brilliancy all over the surface of his picture, and the darks of nearly equal depth, if no one part of the production was more attractive than another, and an equality of interest pervaded every part of it, if, in short, it had *no focus*, it would be a very poor and miserable affair, devoid of both art and interest. Yet we "stop down" our lenses to the smallest possible aperture, and bring all their powers of focus to bear upon the most distant portions of a view, in order to obtain *no focus*, and so ruin pictorial effect and natural truth. Sharp distances as evidence of depth of focus, are mistakes only to be equalled by "white skies." Why, nearly all the poetry of nature lies in the exquisite sensations of the broad free air, the home of the glorious sunlight, and the boundless dwelling place of the fetterless wind; the ocean of the universe, connecting worlds with worlds, and systems with systems; and we are to shut out this mighty element from our beautiful sun-pictures, are to push back our foregrounds, and drag forward our distances, and crowd them into a little white-washed dungeon for the sake of "sharp distances" and "depth of focus." Truly it wont bear thinking of.

The other day, being with my friend, Mr. Simpson, the editor of the Photographic News, we were examining the effect of stops upon the image on the gronnd-glass. I took my station under the focussing-cloth with my eye fixed on the ground-glass screen, and Mr. Simpson changed stops the while. At every change of aperture beginning with the larger and coming to the smaller, there was a clear distinctive variation in the character of the view, distant objects growing sharper and coming nearer, until at length an almost flat map-like appearance gradually became apparent. *Sharpness was everywhere, focus was nowhere, and space was annihilated.*

If I am not mistaken, Mr. Grubb, in one of the early numbers of the Photographic News, referred to this "effect defective" arising from the use of very small apertures and pointed out, by way of illustration, the images produced by telescopes and microscopes. The moon seen by the full aperture of a telescope is in perfect relief, and the prominences on its surface are seen with their cast shadows and real chiaroscuro; but if the aperture be reduced by a small diaphragm, although sharper, it then becomes a mere flat circle with a map-like surface.

The presence of atmosphere is always recognized by the English painter, while the English photographer's prime desire seems to be to ignore it. There is no better illustration of the effect of atmosphere upon retiring objects, than that of seeing how their colours become affected by it. As the green grass of a field retreats every few yards change in color and tone, partaking more and more of that of the atmosphere. So with form, as veil after veil of thin air interposes between us and the object before us, lights grow less powerful, shadows lose their force, and details disappear, the finer and more delicate first, the stronger and bolder last. Perfect detail, brilliancy of light, and depth of shade, are then qualities which, falling in their right place on the more near and prominent objects, represent sharpness where sharpness should be, and thus give a *focus* to the view. For it must be clear that where all parts are equally sharp there can be no focus.

And so I leave the matter in your hands. I think I shall produce a discussion, and hope I shall benefit by it. It is somewhat bold of me to come forward and tell so many old photographers and scientific men that sharpness isn't sharpness, and focus isn't focus, but I have done it and must dare the consequences. The fact is, I want to know what sharpness is, and have in reality only gone in a somewhat rambling way about making the very simple enquiry chosen for a title to this unpretending little paper. Before commencing an argument, the first best thing you can do, is to define terms; and having omitted this preliminary, the next best thing you can do is to begin again without omitting it. And so I end, as I began, with the short question, *Sharpness—what is it?*

THE SOLAR CAMERA: ITS MANIPULATIONS AND RESULTS.

BY SYDNEY SMYTH.*

Having been invited by our worthy secretary to furnish a paper on the solar camera, we shall with great pleasure "put in an appearance" to his friendly summons, and with your kind permission will read a short record of our manipulation, illustrated by specimens of the various processes we employ, and the negatives we deem best for producing the most satisfactory results.

Before proceeding to the more practical part of our subject, we would beg to say a few words in defence of this really beautiful photographic instrument.

Most of you are doubtless familiar with the various methods of enlargement recommended before the introduction of this instrument, and may have perhaps seen the various clumsy implements contrived to produce the desired results.

We remember on one occasion going into the warehouse of a photographic dealer, and were suddenly brought to a stand by a queer misshapen mass of black timber that seemed to our puzzled eye to be something between a reduced copy of Noah's Ark, and the spout used at the east-end wharves for shooting coal. We asked the shopman what new business they were going to launch into, the thought just vaguely flashing through our mind that some expeditious method of vending coal would be a good hit in a west-end greengrocer's store. For in these go-a-head days,—when the careful housewife can have half-a-crown's worth of brushes, and the youngest of her household cherubs hit off for 2s. 6d.: When the lords of the creation can have a hat, best Paris make, for 10s. 6d., including portrait inside to prevent any awkward cases of mistaken identity: When at delightful Greenwich you can have tea, including shrimps and correct photograph of the happy party all inside of the (h)arbour: or when at Epping Forest, you may have your fortune told, and yourself photographed, to send to the handsome young lady what's got her weight of gold all awaiting for you: When, if the wind be contrary, and you are choked in consequence by the smoke, you may send for the sweep, who will, when you pay him, furnish you with his card, when you will learn that he will be most happy to take your portrait (in carbon of course) for 6d.; When the remembrance of all these mixtures occurred to us, it did not seem impossible that the wholesale dealer might not follow in the steps of the photographic retailer, or rather "headsman," and extend his business in popular photographic ways. The indignant shopman, however, informed us that instrument was for enlarging. We think the solar camera upon the table must strike all present as being at any rate an advance upon the clumsy thing we have described.

The plan mentioned by Mr. Hardwich of putting the negative in a hole in the shutter of a darkened room, and throwing the image through the reversed lens upon a screen, has not been found practicable, except where only a slight enlargement is necessary; for it rarely occurs in practice that the light opposite the window is the light of the sky; in nine cases out of ten, on the contrary, the window will command an uninteresting view of a dead brick wall. The only practical means of employing this method is to place a collodion transparency in the shutter, and instead of paper, put a collodion plate to receive the image. A negative is thus obtained from which copies can be taken. When numbers are required, this plan, however, will be better carried out by the solar camera.

* Read at the meeting of the South London Photographic Society, on the evening of Thursday, May 16th, 1861.

There are many who dispute Mr. Woodward's right to a patent; we are not of the number, for we hold that the successful application of an old principle to a new science is next door to a new invention; and if we grant that the principle is akin to the solar microscope, we do not remember to have seen any record of its successful application to photography. Now the point of originality in Mr. Woodward's instrument, and one which we hold much more worthy a patent than thousands so called, is the exact placing of the lens, at the focal point of the condenser; by this means the rays forming the luminous image travel through the centre of the lens, and are parallel. The resulting image is, in consequence, wonderfully free from spherical aberration, and gives in consequence a picture sharp to the margin. When in the dark room this is clearly seen, for the bright spark on the centre of the lens is seen to be the reduced image of the sun concentrated there. The darkened part of the lens plays no part in the production ot the picture, and may therefore be termed the diaphragm, the aperture being just the size of the sun's image.

We have found that the cleanest prints are produced by direct printing, but this plan is frequently very tedious.

There are not many days in the year when we have the uninterrupted beams of the sun for several hours together. It is in consequence very annoying to start with sunshine, and then have to wait an hour in consequence of the sudden arrival of an express train of heavy clouds. Our favourite plan is to print by development; there is a charm about this plan that far surpasses all the many enchantments of photography. The paper is pinned upon the easel, the sun is turned on much after the fashion of turning on gas, and directly afterwards a dim staining of the paper takes place, gradually assuming form, and appearing, in a few seconds, a ghost outline.

The paper is taken down, the developing solution poured on, and rapidly spread by means of a strip of Canton cotton, and gradually there arises out of the surface of the paper a distinct image which goes on increasing in intensity until all the roundness and solidity of life is apparent. We never tire of this part of the process. The rising up of these large images from the blank surface of the paper, is so like magic, that we feel it fortunate we produce these wonders in the reign of Victoria instead of Elizabeth, for we doubt not we should have been rewarded for our pains by a warm reception.

During the winter months we found that the more bromide we employed up to a certain point the more sensitive the paper became.

The salting solution we then used was prepared as follows:

Chloride ammonium	6 grains
Bromide potassium	9 "
Gelatine	4 grains
Water	1 ounce

With paper thus prepared we obtained pictures in three minutes with average sunlight.

The formula which, after many experiments, we think the best, is

Chloride of magnesium	4½ grains
Bromide of potassium	7½ "
Gelatine	4 "
Water	1 ounce

With this solution No. 1 was produced in three seconds on Towgood's paper. We find that the bromide has a tendency to produce green in the tone of the finished print, on Turner's negative paper. The tint is, however, by no means disagreeable on Towgood's small paper. No. 2 will show how important a part the proportions of the salt play in the tone of the picture—you will see the finished print is much warmer. It was produced by the following salting solution on Towgood's small size paper.

Chloride of ammonium	... ...	9 grains
Bromide of potassium	... ...	3 „
Water	... ...	1 ounce

The silver for the first picture was sixty grains. The second picture was prepared with same solution, but a much larger quantity was brushed on. No. 3, is printed on Saxe paper, as also No. 5, but with silver eighty grains to the ounce. We find that on Saxe and Rive paper there is a tendency to excess of half tone, and the paper is extremely rotten in washing.

We salted this paper with the following preparation:—

Chloride of ammonium	... ...	9 grains
Arrowroot	... ...	4 „
Water	... ...	1 ounce

Sensitized with silver ninety grains to the ounce, and exposed for twenty minutes. It developed very slowly, and when finished was by no means over-exposed.

We brush on all our solutions except the hypo. We use several large plates of thick glass, keeping each for its especial use. The salting solution is brushed on and allowed to remain until the paper lays flat, which, with most paper, is about three minutes. Brush on the silver with Canton cotton, reserving the saturated piece to darken any of the shadows that may need it during development.

When we develop we turn up the edges of the print, so as to form a tray and pour on a saturated solution of gallic acid, with a few drops of acetic acid added; the prints develop cleaner when acetic acid is used. To wash away the gallic acid we use a large quantity of water—this is absolutely necessary, otherwise stains would be produced which would not be removed by the fixing. The fixing solution is of the usual strength, and does not appear to alter the colour of the print. All the operations except salting must be performed in the dark room.

The negatives are not varnished: it is necessary that they be taken on perfect glass, as the slightest scratch is made painfully apparent in the enlarged picture. The great thing to be guarded against in producing the negatives is to avoid intensity—a good positive picture with plenty of half tone is just the thing—they cannot be too sharp, and certainly not too clean.

We believe we have mentioned all the points we deem of importance; should we, however, have omitted anything, or not have made ourselves clear, we shall be glad to answer any questions.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this society was held in St. Peter's School Room, Walworth Road, on the evening of Thursday, May 16th. Mr. SEBASTIAN DAVIS took the chair.

After the minutes had been read, and some fine *carte de visite* portraits presented to the society's portfolio by Mr. Wall,

Mr. SYDNEY SMYTH read a paper on "the Solar Camera, its manipulations and results." (See p. 247.)

Mr. V. BLANCHARD then, at the request of the chairman, pointed out the method of working the different parts of the solar camera, calling attention to one on the table. He also passed round several of the negatives, from which some excellent prints, which were hung round the room, had been produced. The negatives were of various sizes, from quarter to half plate; thin, clean, sharp, and full of detail, having been produced by means of iron development, and a bromo-iodized collodion. The prints were of various sizes, from half the size of life to full life size; some were vignetted and some printed to the edges, all clean and sharp; some soft and detailed; others with less detail and more vigour; some grey in tone and some brown. The whole had been produced by development. The specimens elicited much admiration.

Mr. WALL asked what was the largest size to which the enlargement could be satisfactorily taken.

Mr. BLANCHARD said there was scarcely any limit; up to six feet if necessary. It was only a question of getting paper and other appliances large enough, and of giving longer time. They had some double Saxe paper, but had not yet tried it. The greater the enlargement, the longer the exposure necessary, and the coarser, of course, the effect. He had omitted one point of importance in speaking of the manipulating, that was the necessity of having the focus of the cone of rays, coming through the condenser, on the front lens of the portrait combination, and exactly in the middle of that lens.

Mr. G. WHARTON SIMPSON asked Mr. Blanchard if he or Mr. Smyth had ever tried an ordinary achromatic meniscus lens, instead of the portrait combination; as the focus of the condenser being on the front lens of the combination, the back lens appeared to play little part in the enlargement.

Mr. BLANCHARD said they had not tried that; but it certainly appeared to him that the front lens alone would answer perfectly well. They generally used a half plate portrait combination.

The CHAIRMAN asked if they had ever used the solar camera for the purpose of enlarging negatives.

Mr. BLANCHARD said they had not done so, but it would be a very important application. He thought some of Wilson's glorious instantaneous negatives, enlarged two or three times, say to 12 inches by 10 inches would give magnificent prints. They ought to be enlarged before they were intensified sufficiently for ordinary printing. The best plan would be to take a transparency by superposition on a dry plate, and from that enlarge on to a wet collodion plate of the right size.

Mr. SAMUEL FRY had adopted that plan with great success, and thought prints from an enlarged negative better than those enlarged on to the paper direct.

The CHAIRMAN asked if they had tried the effect of enlarging stereoscopic negatives. If good results could be obtained in enlarging them up to, say, 10in. by 8in. it would be an important and valuable thing. It would materially facilitate and lighten out-door operations if from stereoscopic negatives good prints could be produced three or four times as large.

Mr. BLANCHARD called attention to a view of St. Paul's from the Thames, enlarged from a stereoscopic negative to a size of ten or twelve inches. The negative had not been taken for the purpose, and was much too intense; but he thought it would be admitted that the picture possessed artistic qualities, atmosphere, &c., rarely attained in pictures of that size, taken direct.

Mr. WALL had been very anxious to get some good enlarged pictures for colouring in oil. All he had hitherto seen had struck especially by what he might describe as their "emptiness." He had no doubt from what he now learnt that this emptiness and absence of modelling readily existed in the negatives from which they had been taken. They were faithful transcripts of the originals, but enlarging made their faults more glaring. One of the greatest merits of those now exhibited was their freedom from that defect, and it appeared that the sole difference consisted in having suitable negatives, soft and very full of half-tone. Judging from these specimens it appeared to him that more detail and roundness could be obtained by this method than by other methods of enlarging.

Mr. HOWARD said that like many other amateurs he had often desired to have enlarged prints of some of the best of his small negatives, and had tried his hand at enlarging by the usual method. Although that answered very well within certain limits, they could not exceed an enlargement of two or three times without getting some indistinctness. He usually took a transparency first on a dry plate, by superposition, and then by placing that in the camera and elongating to the proper distance, obtained an enlarged negative. He now exhibited one to the meeting.

Mr. FRY said he preferred to enlarge by that method rather than by the solar camera, because he was not, in using it limited, as in using the solar camera, to one class of negative. In enlarging on to a collodion-plate, it was possible from a hard picture to produce a soft negative, and *vice versâ*. His plan was to get a transparency by superposition, and from that enlarge in the camera on to a large Fothergill plate. He had, at one time, used the solar camera, but he now dispensed with both reflector and condenser, merely allowing the diffused light of the northern sky pass through the transparency. He found the results just as good; and the trouble was less, although the exposure was longer. He had, some little time ago, put this process to a severe test, having enlarged a copy of an oil-painting to 34 inches by 23 inches, from a small negative, the photograph being requested that size to enable a tracing to be made from it on to metal for engraving. Before concluding, he wished to ask Mr. Smyth if he had ever used the ordinary sea salts in preparing his paper for printing by development. As these salts contained all the haloid salts used in photography, he thought there might be an advantage in trying them in their natural combination.

Mr. Smyth had not tried, but had often thought of doing so.

Mr. Blanchard pointed out one defect there was always risk of when the printing required a long time. The paper being placed upon the easel wet began gradually to dry and contract, and sometimes the impression would be blurred, or even doubl , in places from the contraction of the paper during slow printing. In some cases where the enlargement had to be painted, the artist did not like photographic paper, and instead, therefore, of printing a picture, the artist could place his canvas on the easel in focus, and a very few touches of the pencil would secure a likeness more perfect than could have been secured in two or three sittings. A great advantage was secured to the artist by this method.

Mr. Hughes said this was an aid of which artists were getting largely into the habit of availing themselves; but, in that case, they preferred the use of a transparency instead of negative, so that they had light in the place of light, and shadow in the place of shadow, instead of the reverse, as when a negative was used. Where this object only was desired, they were not in the habit of going to the expense of a solar camera, the effect being produced by means of a lamp, magic lantern fashion, and thus they were not at the mercy of the sun. For photographic printing with a solar camera Mr. Fry was the first he had heard who objected to the use of the sun, and preferred diffused light. Every one he had known who had used the apparatus, preferred some intense light, and, if they could not get the sun, tried the electric light, or the oxyhydrogen light, or some such direct source. And it was because there was so little sunlight last summer, so little had been done in enlarging. He was so worn out last year by waiting and watching, up to catch every stray ray of sunlight, that he had not had courage this year to get his solar camera fitted up into working order. The difference between direct sunlight and diffused light in the solar camera was as great as between daylight and moonlight, and as for the brilliancy and distinctness of the image there was no comparison.

Mr. Wall now read his paper, "Sharpness—what is it?" (see p. 244.)

Mr. Hughes could not help thinking Mr. Wall had selected a wrong title for his paper, interesting as it undoubtedly was. The real question they had to consider, he apprehended, was not what is sharpness; but how to use it: when in place and when out of place; how far artists have agreed; and how far photographers have made proper use of their powers. Mr. Wall had stated that photographers were not agreed on the quality; but he thought artists were quite as undetermined. It was as difficult to define a term like sharpness, as it was to define any primitive sensation. They might know perfectly well what it was, but have no words exactly to define it; and thus they were often driven to describe it by what it was not, by its absence rather than by its presence. He might say, look upon the ground glass when you have got an image in focus, and you know what sharpness is, for you will see it. What they saw was sharpness; but how far it was desirable to use that sharpness was another question. Sharpness was very desirable in a razor, but not so in a paper-knife. It was like everything else in this world of ours, it was wrong when out of place. The old adage of the danger of putting sharp tools in the hands of children, really seemed to meet the whole question. Inexperienced and ignorant photographers misused this valuable quality, and defined the brick wall more carefully than the head of a person who stood near it. But was sharpness to be decried on this account? On the contrary, let it be in its proper place, and let them use all their powers, optical and chemical, to secure it in its highest and most exalted condition. What had been hitherto the greatest objection raised to the enlarged pictures of the solar camera? Simply their alleged want of sharpness. It was one of the most important qualities, and they must never neglect it. He would have been glad if the paper had drawn the distinction between sharpness and hardness; had pointed out how the former quality was to be obtained, how it was to be used, and how it might be misused, as all good things might be abused. In portraiture, for instance, they all knew the vital and important part was the eye, the "window of the soul." That was the all-important point for focus. It was a first condition of good portraiture that the eye be sharp. If there were any expression of character or intellect in the face at all, it would shine out there, and thus it became the point for focus. He thought photographers knew this and aimed at this. He did not think they were so wanting in this matter as friend Wall seemed to imagine. They might frequently come short of what they desired, there were many things not under their control; their chemicals would not always register every gradation their lenses would give. It had been more want of means than want of knowledge of what was desirable that had rendered many photographs so hard; but he hoped things were improving in this direction. He was glad Mr. Wall had not endorsed Sir William Newton's plan of turning the lens out of focus. It was no wonder photographers did not sympathize with that notion. If Sir William had spoken of the want of gradation and softness, instead of complaining of excessive sharpness, he would have had the sympathy of both photographers and artists. But still he thought there was a tendency in Mr. Wall's paper to saddle on the back of sharpness the faults of hardness. All photographers were agreed in condemning the latter quality. But they were also agreed in the importance of the former. It was to secure it they gave ten guineas for a lens instead of one guinea. It was a great mistake to attribute the sharp outlines to a bad lens, and the want of outline to a good one. The converse was true; it was one of the common faults of bad lenses that they gave sharpness nowhere, neither in the outline nor any where else. Hard outlines, &c., were more a matter of lighting than anything else, and a lens which gave no definition would never produce a good picture. He wished to be distinctly understood he was not advocating hard outlines; his main object was simply to assert that photographers were not so disagreed as Mr. Wall imagined as to what sharpness was. They knew very well what it was; but a picture might be sharp and soft, or sharp and hard. They required a good lens to give them sharpness, but some of them required to be taught to use it in the right place.

Mr. Howard thought sharpness was a necessity which had arisen of late years, out of the practice which photography had introduced of delineating nature in minute forms. In large paintings it was not required; but in cabinet pictures and miniatures it was more important, and in the photograph most of all. In the early photographs it was a common complaint that one-third of the picture was out of focus; and in pictures so minute as to be examined in the hand, that was a glaring fault. It was true that the human eye could not take in every object in a landscape and see it in focus at one time. If the eye were fixed on an object half a mile off, and then an attempt made at the same time to get something in focus within a few yards, it would be found to be impossible; but still in a picture, the whole of which could be examined at once, bad definition would be a fault. Sharpness, therefore, he considered an absolute necessity in small pictures.

Mr. Eidmanns made some remarks on the difference between the operations and results of the artist and the photographer, the import of which we did not catch.

Mr. Fry thought that this question came very appropriately after the discussion on enlargement. The specimens in the room were, he thought, as sharp as it was possible to produce enlarged pictures, and yet the chief objection to them in the eyes of many would be that they were not quite sharp.

The Chairman would define sharpness as freedom from optical distortion. The amount of sharpness desirable in a picture mainly depended on the distance from the eye it was intended to be placed; and the enlarged pictures before them, when placed at a proper distance from the eye, were as sharp as need be desired. Regarding the practice of photographers, he thought that few would be found who would attempt to focus for the distant parts of a picture.

Mr. Wall, on rising to reply, said he must repeat his conviction that considerable difference of opinion did exist amongst eminent photographers on the subject of sharpness, and excess of that quality condemned. Mr. Sutton said that one of the evils of the introduction of collodion had been the exalting of sharpness to the detriment of other more important qualities. Lake Price had condemned the "parrot cry of sharpness."

Mr. Hughes begged to suggest that Mr. Wall was mistaking the aim and intention of these writers. If one eminent photographer had distinguished himself more than another in insisting on the importance of sharpness it was Lake Price. One of the most important chapters in his book was devoted to the use of stopes, and he had contrived a method to facilitate the insertion of a central diaphragm after focussing; all these things in furtherance of that very quality of sharpness.

After some further conversational discussion.

Mr. Wall resumed. In reference to Mr. Hughes' remark, that it might be ascertained what sharpness was by looking on the ground glass. That would be very little use to a blind-man, and the man whose eye was not educated was literally blind: he was convinced that many photographers did not understand what the quality really was, and they must be taught to see it before they could seize it. Regarding his remark, that sharpness was the quality of a bad lens, he thought he was probably wrong, and Mr. Hughes right, that hardness of outline which he had attributed to the lens was probably due to manipulation and lighting. Regarding Mr. Howard's remark as to sharpness being a necessary quality to small pictures, it was perfectly true that a cabinet picture would be more minutely detailed than a large oil-painting; but each would have its focus of sharpness, in which the chief objects would receive the most perfect definition. Mr. Fry had referred to the pictures of the solar camera as deficient in sharpness, but he, Mr. Wall, thought the pictures before them possessed more perfect gradation and detail than almost any small pictures he had seen. The chairman had doubted whether any man would ever think of focussing on a distant part of a view. Now, he remembered not long ago, in one of the societies, great praise was given to the pictures of a lady because a church, five miles off, was as sharp as the foreground. He still thought more attention should be given to the subject that it might be distinctly understood that hardness was not sharpness.

Mr. Simpson suggested that Mr. Wall might with advantage at some future period devote a paper to the proper place and use of sharpness.

The Chairman announced that the next would be the annual meeting of the society, and that the committee would have several alterations in their rules to propose.

Mr. Hughes referring to this subject begged to suggest that, as a period had come in which it was desirable that the constitution of the society should be remodelled in various points, the committee should take the subject into consideration, and be prepared with their recommendations on the subject in the annual report.

After the usual votes of thanks the proceedings terminated.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 22*nd May*, 1861.

For some time past rumours have circulated of a marvellous application of photography to sculpture, made by a young Belgian artist, François Willême by name, which, in the absence of full particulars, was looked upon with doubt and suspicion, as seeming impossibility was involved in it. Nothing more nor less than the actual production of statues, &c., by the agency of photography, without the aid of the sculptor's hand, was claimed for this new discovery or invention. At first sight this proposal would really seem to involve a contradiction, as two arts, based on entirely different principles and methods, were ostensibly combined in one. For how could it be supposed that by any graphic process whatever a plastic work could be obtained, seeing that one produces its results on a plane surface by means of light and shade, and the other by relief? However, Mr. Willême appears to have solved this singular problem, and the results, pronounced by competent authority to be unexceptionable, are now before the public; and as you have now the details of the process at hand, you can readily judge for yourself whether the applications of photography are not surprisingly and ingeniously enlarged by the genius of Mr. Willême. He claims to have demonstrated that, by the aid of photography, he can produce sculptures from nature, from the living model, from the inert model, from microscopic objects enlarged, sculptures of the same size as the model, or enlarged or diminished, grotesque sculptures, and bas- or alto-relievos.

The Exhibition of the French photography, now open, commands a large share of public attention and admiration. As it is two years since a similar display was made here, the progress of the art in various directions is strikingly apparent. Those who are most anxious and exacting about the artistic element in photography must, I think, be fully satisfied now that there is no fear that photography will be deficient on that score. In portraiture especially, do we find the fullest recognition of the principles of art; the productions of Delessert, Count Aguado, Mayer Frères, Fargier, and others that follow in their wake, are ample vindications of the claims of photography to be ranked among the fine arts. Each year we have thought that the limits of perfection had been reached, and yet this year's productions certainly eclipse all preceding efforts. Portraiture makes much larger demands upon the artistic talent of an operator than either landscape or architecture, for in the latter his chief concern is in a good selection of the point of view; he has no control over nature's chiaroscuro, but in portraiture he must himself create the chiaroscuro; and considering how few among the professors of art themselves truly understand the elements or appreciate the importance of this prime element of art: our surprise at the comparative variety of artistic portraits will soon give way to the surprise induced by meeting with good portraits at all.

Our present Exhibition is exceeding interesting from one feature alone; apart from the many other claims it has upon our consideration, it exhibits specimens of most of the new methods and processes that have been introduced to notice during the past few years. Life-size portraits occupy a very prominent position in the collection, not only on account of their remarkable dimensions, but also by their number and remarkable excellence. M. Edouard Delessert's works would almost form a good exhibition of themselves—he has no less than fifteen portraits and groups, almost all of which are full-length and life-size; among the groups is a pair of ponies, one-third the size of nature! he has also a group of white terriers, which seem instinct with life. But of all his works I most admire a portrait of a lady in black drapery, which is worthy of the pencil of Vandyck.

M. Joly-Granzedor, whose name is new to photographers, comes upon the scene, like a comet, in a blaze of dazzling splendour. No one knows where this master served his apprenticeship, but it was in a good school wherever it may have been. His pictures are representations of ancient and modern statues and bas-reliefs, and are intended to form a museum of the choicest productions of the plastic art.

M. Bertsch, of whose automatic camera you have heard already, and whose studies have thrown so much light upon the principles of the solar camera, exhibits several specimens of enlarged pictures, taken by his two instruments. They fully sustain all that he has claimed for them.

M. Vilette exhibits some enlarged collodion pictures obtained by the agency of the electric light, and transferred to paper by Moitessier's method: it cannot be said that they are at all satisfactory.

M. Poictevin sends some excellent specimens of the results obtained by processes of his invention, as carbon printing, positives on glass in vitrifiable powders. The excellence of these productions bear ample testimony to the value of the persevering and intelligent researches of this veteran in the art.

The specimens exhibited by M. Fargier testify that his method has recently undergone great improvements, and leave little or nothing to be desired in the way of vigour and transparency of the tones, and the brilliancy and purity of the lights.

M. Lafon de Camarsac, whose ingenious processes have been described in your columns, exhibits some very remarkable positives on paper. But his enamels excite the most interest and admiration. These pictures, which have passed through the fiery funace, are unequalled in photographic excellence, both in modelling and delicacy of tone. While the shadows are of perfect transparency, the whites retain all their pristine purity. This application of photography is full of promise.

Of the comparative activity prevailing in photography in different countries we may perhaps venture to draw some conclusions, although their value may be insignificant. The number of works exhibited is 1266. The number of exhibitors is 150, of whom only 25 are foreigners. Of the latter 8 are English, 4 Dutch, 3 Swiss, 2 German, 2 Belgian, 2 Italian, 1 Spanish, 1 Norwegian. Thus it will be seen that England stands numerically at the head of the foreign contributions. Something more might have been expected from Germany, which has been outstripped by phlegmatic Holland.

FORMIC ACID IN THE DEVELOPER.

Sir,—Your Paris Correspondent would seem to imply that the addition of formic acid to the protosulphate of iron developer is a new discovery of M. Ferrier, whereas it is as old as the use of protosulphate of iron itself. Although formerly much employed in this country, it has of late years fallen into disuse, but many good photographers still adhere to it. In the 2nd volume of the *Journal of the Photographic Society*, p. 201 (July, 1855) the following formula for an iron developer is given as the best the writer had ever tried :—

Water	6 ounces,
Common acetic acid	30 minims,
Sulphate of iron	1 drachm,
Formic acid	1 drachm.

And in volume 3 of the same journal, p. 278, I find that Mr. Rodger, of St. Andrews, recommends formic acid with pyrogallic as well as with iron. His formulæ are as follows :—

1. Pyrogallic acid	40 grains,
Water	16½ ounces,
Ordinary spirits of wine	1½ „
Formic acid	2 „
2. Sulphate of iron	2 ounces,
Common water	16½ „
Dissolve, and add spirits of wine	1 ounce,
Formic acid	1½ ounces,
Sulphuric acid	5 drops.

Mr. Rodger says of the preceding pyrogallic developer, that it brings out the details of the deep shadows, which with most other solutions would be entirely lost. He, therefore, prefers it for landscapes, and for portraits of gentlemen, while for female portraiture the iron developer is preferable. This he uses much in the same way as Mr. Lacy, of Ryde, described by you at p. 13 of the present volume, and, like him, intensifies after fixing.

It seems that M. Ferrier has been trying the effect of nitrate of lead in his silver bath, as an accelerating agent, and found (your correspondent does not say how), that it presented the phenomenon of containing formic acid, which was at once pronounced an accelerator, and that Taupenot plates prepared in this bath required only one-third of the ordinary exposure. As this matter is interesting to photographers perhaps your correspondent will favour us with more precise details on the subject.

Whatever may be the merits of M. Ferrier's instantaneous negatives of Paris, he has been anticipated by those of Mr. W. England, the artist of the London Stereoscopic Company, to say nothing of the productions of other artists, English and American.—Yours very truly, R. A. R.

[The use of formic acid in an iron developer is, as our correspondent states, very old, but we do not remember to have heard it described before as an accelerator. We fear that our French brethren are not always in the habit of describing very freely and precisely what they regard as important secrets. The chief interest, we apprehend, attaching to these instantaneous pictures is their extreme sharpness with so many figures in motion.—Ed.]

CORRECTING NITRATE BATHS.

Sir,—It appears from some communications I have received, that my directions for testing organic matter in distilled water, were not sufficiently explicit. If you can spare a corner, perhaps you will be kind enough to insert the following addenda.

It is not necessary to isolate the oxide of silver before using it as a test. The experiment is much simplified by adopting the following plan :—

Dissolve thirty grains of nitrate of silver in an ounce of water, then add a drop or two of liquor potassa, set it by till the insoluble oxide has completely subsided (it must not be filtered).; a drachm of this clear solution is to be added to four or five ounces of the suspected water, and exposed to the sun's rays or a strong light. The depth of colour which it quickly assumes shows the comparative amount of organic matter present; the absence of any tint proving its purity.

Then with respect to making a new bath. Assuming a small quantity of nitrate of potash, perhaps not more than is formed by the insertion of two or three collodionized slates, to be no objection, the organic matter in both the distilled water, and nitrate of silver, may be precipitated, and the free nitric acid neutralized by adding liquor potassa gradually till a permanent precipitate is formed, and exposing it to a strong light previously to its being filtered for use. The addition then of acetic acid brings it into good working order for negatives.

Liquor ammonia may be substituted for liquor potassa: but for inexperienced hands I recommend the latter.—Your obedient servant, Thos. A. Barber.

KEEPING QUALITIES OF PETSCHLER AND MANN'S DRY PROCESS.

Sir,—Perhaps the following brief testimony to the sensitive and keeping qualities of Petschler and Mann's process may not be unacceptable to your readers.

In October last I prepared some stereoscopic plates according to this process; in February I resensitized them by the second washing in plain water, but circumstances prevented my using them. A week since I exposed one by lamplight for ten minutes, and yesterday developed it, getting a transparent positive, not equal to Ferrier's, certainly, but respectably good. I have tried all the dry processes, but have never found one to behave properly under such an accumulation of difficulties. I may add that I have recently tried Hannaford's modification with great success as to cleanness of development, but it appears to me to be slower than the original.—Yours, W. H. Ranking, M.D.

Photographic Notes and Queries.

The Photogen.

Dear Sir,—Having had my attention drawn to a statement from one of your correspondents in the News of the 17th inst., I beg to say that the 300,000 is certainly a mistake; it should be 30,000, and if it should interest any one so far, I shall be happy to show vouchers for the truth of the last numbers. I assure you, sir, I am sorry the error should have crept in, because it must be evident to every one that there is no difficulty in producing first-class pictures by the photogen, and therefore no need of any statement to mislead. I can say with truth that any one with ordinary application and intelligence can produce good pictures by its aid. And can refer with some degree of pride to the successful experiments recently carried out by the practical men forming the management of the North of England Photographic Society, and also to those fine specimens of night photography exhibited at the Crystal Palace, taken by that eminent photographer, M. Garnier, of Guernsey. —Your's truly, John Moule.

Sir,—In your last number a correspondent speaks of a want of public confidence in the night process. In answer, I am happy to state that such has not been the result in my experience. On the contrary, I have often in one night taken above 60 portraits by the photogen; and have even been compelled to turn away business, through having worked myself out of the necessary composition.

I am now bringing the process before the public, at that popular place of resort, the North Woolwich Gardens, where I have not the least doubt of obtaining the same amount of public appreciation which has hitherto attended my labours in the metropolis. I am, sir, yours, T. Ambrose, Photographer.

Talk in the Studio.

APPARATUS FOR ITALY.—We recently referred to a large order for photographic apparatus which had been sent to this country by the new Italian government. We saw the other day at Mr. Ottiwell's a somewhat extensive looking camera which formed part of this order. It was for plates 32 inches by 24 inches, with sliding body extonding from 36 inches to 110 inchos, the focus being adjusted by means of the screw and winch from behind. The stand on which it rests is a framework of about nine feet long by about three feet high, and three feet wide, which is placed on wheels. It appeared altogether a very perfect piece of cabinet work. It was fitted with one of Dallmeyer's triple achromatic lenses made expressly for that size. Another lens and camera of the same description for tho same government was for plate 15 inches by 12 inches, and extended from a focus of 10 inches to 55 inches.

PHOTOGRAPHY IN THE ROYAL ACADEMY OF ARTS.—The position eoloured photographs are to occupy as works of art remains to be defined. Painters deny that thoy have any right to be classified as paintings; and photographers refuse to acknowledge them as photographs. It is frequently urged that they should not be received in photographic exhibitions, and they are rigorously oxcluded from public galleries of paintings. Copy your photograph upon canvas, or paper, by any of the many purely mechanical methods in use, and *then* colour the same, and you have real work of art. Omit this *mechanical process* of copying, and your production is that pariah in the world of art "only a coloured photograph." Under these circumstances wo were extremely amused to hear from *indisputable* authority, that occupying the post of honour "on the line" in this year's Royal Academy Exhibition, there hangs a *coloured photograph*. To say more may not just now be advisable.

PHOTOGRAPHY BY MACHINERY.—Speaking of the American invention we described some time ago, a Lyons newspaper says, a machine has just arrived from America which is capable of printing 4,000 photographic proofs in an hour from the same negative. The paper used is said to be prepared with gelatine, and impregnated with iodine of silver mixed with other substances, which endow it with extraordinary sensibility. It is then rolled on a cylinder, and unrolled, when in the machine, by clockwork, so that each portion remains about a second opposite to the negative which, during the movement of the paper, is covered by a lid worked by the same machinery. The sun's rays are brought to bear upon the original in a concentrated form by means of a powerful lens. The result is said to be that photographs which, by the ordinary process, cost at least 1f. 50c. each, can be produced at the rate of a sou each.

STAINS AND STREAKS.—We have received several communications on the subject of Mr. Thomas's paper, and our own remarks thereon, the latter of which have in all cases received ample corroboration and endorsement. Several correspondents speak of working with perfect immunity from these annoyances in rooms abundantly illuminated with yellow light, and somo where very little care is taken to exclude all stray beams of white light. We would press it upon the attention of our readers, however, that too much attention cannot be given to having a room chemically dark, wherever brilliant and rapid printing negatives are desired. A slight amount of deposit on the shadows, caused by diffused light, often entirely alters the character of a negative, and destroys its brilliancy.

DETERIORATION OF YELLOW GLASS.—A correspondent has called our attention to the deterioration of yellow glass from exposure. Some deep orange which he has used, and which acted perfectly at first, has gradually lost colour, and allows the actinic rays to pass. He describes the respective tints of the glass before and after long exposure, as the latter like a glass of pale sherry and water, and the former like the glass of brandy and water, supplied at a road-side inn. It would be wise on the part of photographers now and then to examine their yellow glass and ascertain if it retains its non-actinic character.

YELLOW CLOTH.—Mr. E. Seelig, one of our correspondents, has sent to us a piece of bright orange woollen-cloth, which he has found useful in tent windows. It appears to us much more likely to answer the photographer's purpose than either yellow calico or yellow tammy, as in both these materials minute holes admit white light, whilst here no trace of white light passes.

To Correspondents.

R. H.—Two grains of the double salt of gold are generally stated to be equivalent to one of chloride of gold. We prefer, however, the use of the chloride. In neither case is there any guarantee against adulteration.

G. W. HALE.—The whole of the pictures forwarded arrived safe, the large ones considerably injured, however, in the post. Your results for 18 months' practice are very satisfactory in every department. The card portraits merely require a better background, and the sitter placed a little further from it, to make them very perfect. The paper stereoscopic is very good indeed, as are also the transparencies. We shall be glad to know your method of developing them, as the tone is very excellent. Of the large pictures, that which has the least pictorial value is the best photograph. The other two are both a little under-exposed. It is a wholesome rule to expose for the deep shadows, and leave the lights to take care of themselves. If your object be to sell any of them, the qualities of all are up to an average market standard; but much will always depend on the interest of the subjects. The transparencies have the most commercial value.

S. F. TREVONRY.—From your description, it would appear that your bath contains organic matter. It is necessary before sunning a bath to neutralize the acid, or render it slightly alkaline. Add a little oxide of silver, and then expose to light. See Mr. Barber's letter in the present number. The method of cleaning your glasses would not cause the solarization. Add a little more bromide to your collodion. After sunning your bath, add a minute trace of nitric acid.

D. HILLS.—We do not know, at present, of either stereoscopic or whole plate camera and lenses for sale second-hand.

J. L. S.—We fear that no mere description of the appearance of yellow glass will be a safe guide as to its resistance of actinic rays. The best plan will, in all cases, be to test it. Pot metal will undoubtedly be better than flashed glass, although where silver is used for producing the colour in flashing we believe a perfectly nonactinic yellow is produced. The glass to which we referred as not admitting actinic rays, was light orange pot metal, supplied by Mettam.

VINDEX.—We know nothing of the circumstances you state, which are certainly not very pleasant. But would it not have been better in making such statements in a "private and confidential" manner to have added your own name? As the matter at present stands, although the statements may be true, they are unauthenticated. An anonymous letter does not prove much.

J. A. S.—As a general rule, a more vigorous negative is desirable for producing good results with alkaline toning than with the old hypo-bath. The gold-toned print you sent would have been much better if it had been printed a little deeper, and if the negative had been a little more vigorous. But the difference in the character of the paper on which the two are printed, is alone sufficient to account for the difference in brilliancy. No. 2, the sulphur-toned print, is on highly albumenized Rive paper; whilst No. 1, the gold-toned print is on slightly albumenized Saxe paper. If you use the No. 2 paper with an alkaline gold bath, and print a little deeper you will, we think, get brilliant prints.

HERBERT OGG.—Communications will reach this gentleman if addressed to him, to the care of Mr. T. B. Thompson, 3, Kingston Russell-place, Oakley square, N. W.

STEREOSCOPIC EXCHANGE CLUB.—Members are informed that the address of Mr. Emil Seelig is at present, 10, Moorgate Street.

PHOS.—We are glad to learn that you find our collodion formula so successful. The stereo print forwarded as specimen is very good indeed. We like the plan of camera printing for transparencies ourselves, its chief difficulty is that it does not always give the same rich vigorous tones as dry plates. We shall have an article on the subject in this or an early number. In the method you describe, you do not appear to have any means of enclosing the negative, so as to exclude all light, but that transmitted through it. Where available, the direct light of the sky would, moreover, be better than the use of a mirror. Where a mirror is used, you can only get just the quantity of light reflected from a part of its surface exactly the size of the negative, whereas when the negative is directed to the sky, a flood of light from all parts of the sky passes through it. The mirror would only be available when you have no opportunity of getting the light of the sky from your room being surrounded by buildings. In that case it would be valuable. Regarding the colouring of photographic transparencies for the magic lantern, the only plan would be to adopt the usual method of colouring transparencies on glass; and we fear the discrepancy between the coarseness of the colouring, and the delicacy of the gradations in the photograph would be painfully apparent when the transparency is enlarged on the screen. We have never seen anything of the kind well done.

X.—We are obliged by your note, which you will see we have referred to in another column.

M. A.—Your print is over-exposed and under developed. Try the collodion of the second maker you name; we will write to you.

W. A. B.—We have not used formic acid in a negative developing solution. We believe it has a slightly reducing action itself, and therefore might act as an accelerator.

J. F.—We have repeatedly recommended fresh starch for mounting photographs. Acid gum or paste will inevitably injure the picture. India-rubber dissolved in benzole may also be used.

J. A. L.—Your printing bath is too weak. See that it is at least 60 grains to the ounce. The old-fashioned printing frame you describe is very inconvenient. The hinged back is indispensable to allow of the print being examined during the progress of printing. You can get that one altered.

W.—You can scarcely complain if your apparatus proves inefficient when you paid an inadequate price for it. Cheapness, or falsely called cheapness, has been the bane of photography.

*** The letters of two or three correspondents arriving just as we are on the eve of going to press, have got mislaid, and cannot be answered, they will oblige us by writing again.

Several articles in type, the letter of our German Correspondent, and several others, stand over for lack of space.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, PATERNOSTER-ROW.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 143.—*May* 31, 1861.

PHOTOGRAPHY AND THE EXHIBITION OF 1862.

The Council of the Photographic Society have received from Her Majesty's Commissioners for the International Exhibition of 1862, an answer to the letter of the Chief Baron, the President of the Society, which we published in a recent number, protesting against the classification of photography amongst machinery and the mechanical arts. This answer, we regret to state, is not of a satisfactory character. The Commissioners either really or wilfully misunderstand the claims of photographers as stated in the Chief Baron's letter. Entirely ignoring the claim made for photographs to rank as works of fine art, they state that they are perfectly willing to allot a distinct department to photographic apparatus and photographs, in which such distinction or division may be made between the latter and the former, as the representatives of the Society may think desirable. The confusion between the tools of the art and the productions of the artist, is still maintained in the language of the Commissioners. Such a compromise was resolved not to be accepted by the Council of the Society. The Chief Baron has again written to the Commissioners, re-stating emphatically the claims of photographs to be regarded as works of fine art, and as something essentially distinct and different from the apparatus and mechanical appliances used in producing them. The letter also suggests to the Commissioners the propriety of appointing an occasion on which a deputation of the Society shall meet them, and thus explain and enforce, orally, the claims he makes in his written communication.

We commend the dignified attitude the Council of the Society are maintaining in this matter, and trust that it will be crowned with the success it deserves.

THE SOLAR CAMERA.

The possibility of enlarging photographs, and producing pictures of life-size has always been familiar to experienced photographers, the process being merely a reversal of ordinary operations, and thus instead of producing a small negative from a luminous object of life-size, producing an image of life-size from a small negative rendered luminous by the transmission of light. There have been two methods of enlarging practised: the first and simplest, that which we have just indicated, in which a negative is placed in the camera, and the light passing through it, an enlarged image has been projected on to a sheet of calotype paper, placed on a screen in focus, and after sufficient exposure the production of the picture completed by development. The second process although not so simple or direct has been more generally practised, and has been regarded as easier and more efficient. It consists in getting an enlarged negative by means of two operations. A transmitted, or transparent, positive on glass has first been produced from the negative to be enlarged, either by superposition, or printing in the camera; and from this transparency an enlarged negative has been produced on a collodion plate by the method we first referred to, and from this the enlarged prints have been produced.

From whatever cause neither of these methods have been practised to any great extent. The processes have been too troublesome, or the results have not been sufficiently good. Probably both causes have had their influence. Some two or three years ago, however, an immense revolution in the art of enlarging was announced, and immense improvement in the method of manipulation, and the result was promised. Mr. Woodward, an American gentleman, a portrait painter, we believe, had invented an arrangement for enlarging, which he called a solar camera. It was in point of fact an adaptation to photography of the principle of the solar microscope. The enlarging appliances were an ordinary enlarging camera with portrait lens, and sliding frame for the negative; but instead of pointing the negative to the zenith, or the northern sky, a powerful plano-convex condenser was attached, and a mirror with an arrangement for placing it at any angle, and also making it revolve round the condenser. By means of the mirror the image of the sun was thrown on the condenser, and by it passed through the negative and brought to a focus on the enlarging lens.

The enlarged pictures produced by these appliances were said to be amazingly perfect, and free from the objections which had usually attached to large pictures. They were well defined, delicate, full of modelling, and free from distortion even when the enlarging was carried to an enormous extent. The prints were more brilliant as they were produced by actual sun printing in a comparatively short time, without the aid of development.

We have been for some time past patiently watching the development of this enlarging process which promised so much. The means appeared to us very inadequate to the results promised. We saw no new optical appliances to effect the wondrous improvement. It was simply the old method of enlargment with facilities for better lighting the negative. The information on the subject has been very scanty and meagre, nobody seemed to have an idea upon what occult influences the improved results depended. Some of our French scientific neighbours, who took up the matter warmly, soon got themselves into a complete state of mystification and tangle by endeavouring to devise theories on the subject. The specimens were scarce; but what we did see, although taken under unfavourable circumstances, were full of promise, and showed an absolute improvement upon any we had seen produced by the old methods. Since the invention has been before the public, the weather has been singularly unpropitious, and thus it is we presume so little has hitherto been done in the matter.

As we conceive the question of efficient enlargement to be a very important one, we were glad to see the subject brought forward at the recent meeting of the South London Society, by Messrs. Smyth and Blanchard, and illustrated by a number of enlarged specimens. All of these were good, and many of them of very high excellence. There was nothing offensively coarse in the result of the enlargement; the pictures were round and well-modelled, perfectly defined, and satisfactory in their general effect, eliciting the admiration and commendation of all who saw them.

The results, then, are superior to those produced by former methods. To what is this superiority due? Until we saw the solar camera in operation we could not understand. We have said before that superior lighting facilities appeared to be the only addition to the ordinary method. It *is* to superior lighting the results are due; but how much superior! We know of nothing in photography more pleasing and unexpected, than the first sight of the exquisitely brilliant image of a good negative, as projected on the screen by means of the solar camera. It is to this brilliant lighting, which registers so perfectly, and with such force, every delicate tone in the negative, and to the selection of proper negatives that the improved results are due. The negatives must be perfect; the glass on which it is taken must have no flaws; the film must be even and without structure; the image must be perfectly sharp and well-defined throughout; it should be full of soft gradation, without much intensity, no patches of light, possessing detail and drawing in the shadows, but no foggy deposit over them; it must be free from the slightest spot or stain; and it must be unvarnished.

Regarding many points of the working of the instrument, as we have said before, much mystification has prevailed. The instructions have been precise to the effect that the focus of the condenser should be on the front lens of the portrait combination used for enlarging; but why this should be so has not been stated, or why a portrait combination should be used at all. The sole object of having the focus of the condenser on the front lens appears to be to produce the effect of a small stop so far in front of the lens which is forming the image, and which is in this case the back lens of the combination, and thus produce a flat field. The chief part the front lens in the combination plays, in this case, is simply that of a diaphragm, whilst the back lens, undoubtedly not the best for the purpose, enlarges the image. A simple view lens would, we imagine, answer the purpose better. We suggested to Mr. Blanchard the other day the substitution of the front lens only of his portrait combination; he at once tried the experiment, which resulted in a finer image on the screen. In taking large heads, or vignette pictures, a flat field is of comparatively little moment; but if landscapes, or full-length figures be enlarged, it becomes an important point. In such cases we imagine the use of a triple achromatic lens, with the focus of the condenser on the central lens in the combination, would be the best for the purpose. We think in any case decided improvement may be made in the present practice.

One remark here as to the necessity of the sun. Without absolute sun-light there is no use for a solar camera; the reflector and condenser are much better dispensed with when there is no sun. Without a direct source of light there is nothing to condense, and the negative is better illuminated by presenting it direct to the sky, when diffused light only can be obtained. A few minutes thought, or a single experiment will render this so obvious, that it is unnecessary to dwell upon it.

As regards the chemical part of the operation, the idea of sun-printing is, we believe, almost, if not entirely, given up. The necessity of uninterrupted sunshine for a period varying from one to several hours, is alone an immense difficulty; but when it is remembered in addition, that the earth does not stand still during that time, but continues its revolution, and the only means of adjusting the instrument so as to prevent the shifting of the image by the varied position of the sun in relation to the condenser, is by means of a hand adjustment of the mirror, it will be seen that the difficulties are well nigh insurmountable. Fortunately, however, excellent results are to be obtained by means of development. The chief questions open at present appears to be as to the best means of keeping the image on the surface of the paper, and of securing a satisfactory tone. As regards the former, all the appliances available in sun-printing are at command. That at present most used in sun-printing, the application of a surface of albumen, appears least suitable for development printing; whilst the various substances, such as gelatine, arrow-root, Iceland moss, gum tragacanth, &c., all answer the purpose more or less perfectly. The last substance, proposed originally for sun-printing by Mr. Shadbolt, seems to possess many qualities well suited to the purpose. Some of the best toned and most vigorous enlarged prints we have seen, have been prepared with this substance by Messrs. Smyth and Blanchard, from whom we hope to receive some further details of their working, as experience suggests improvements. The tone and vigour of the image are both much affected by the salts used in preparing the paper. Varied combinations of the different haloid salts are now used, and it appears somewhat difficult to adopt a standard and say, "this is best." Varied proportions must be used with different papers and for different subjects. Indeed, as Mr. Blanchard remarked to us the other day, the successful solar camera printer will learn to study the character of his negatives, and adopt slightly different formulæ, as well as modified manipulations, for each. Without such attention, weak, sunken, and poor, or hard and flat images will be more common than good pictures.

One word as to the patent. We have repeatedly been asked the question, in what did the patent consist, and how far might photographers manufacture similar enlarging cameras for their own use. We are unable to answer the latter of these questions with certainty; but we may make one or two remarks to assist our readers in forming their own judgment. As regards the former, the words of the specification before us are: "I wish it to be understood that I do not claim the photographic camera obscura, or the solar reflector and lens, or any part thereof of themselves; but what I claim as new under the above in part recited letters patent, is adapting to the photographing camera, a lens and reflector in rear of the object glass, in such manner that the instrument may be made to answer the two-fold purpose of a camera obscura, and a camera lucida, substantially as and for the purpose herein specified." Now there can be no doubt but the new application of an old principle may become properly enough the subject of a patent. The question here is as to the novelty of the application. The reflector and condenser are parts of the solar microscope, and the use of this for photographic purposes was amongst the first photographic experiments. In the *Journal of the Royal Institution* for 1802, Mr. Wedgwood describes his photographic experiments with a solar microscope. The earliest operations of the Rev. Mr. Reade and Mr. Fox Talbot, were with the same instrument.

How far these facts affect the question of the present patent, we are not in a position to state. The instrument in its present state is somewhat clumsy and expensive, and thus offers great temptation to disregard the patent. Some of the condensers are full of striæ, which is a serious imperfection; they should be made of optical glass to be entirely efficient. For sun-printing the mirror should be attached to a heliostat to follow accurately the motion of the earth. Various imitations have been made both in America and on the Continent. An American journal now before us announces one, as efficient as the most costly, for twenty-five dollars, or about £5. How far these imitations effect the patent, or how far they are efficient, we cannot tell; we believe the holder of the patent in this country paid Mr. Woodward a good round sum for the right to make and sell, and we should be sorry for him to lose his money. The best protection against piracies is, at all times, to make an article so efficient in operation, and so moderate in price as to render imitations worthless and unnecessary.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Combine.—When the parts of your production have that harmonious connection, or unity, essential to pictorial effect they are said to *combine* well.

Confused.—The eye always requires that some portion of the picture should be devoted to repose. When this rule is not observed, or the component parts of the work do not *combine*, the spectator's eye speedily grows perplexed and wearied, when the picture is said to be *confused*. A portrait, with attractive accessories too forcibly defined; a landscape in which the source, or sources, of illumination are not easily detected; or a group of many figures in which each assumes equal importance, will easily produce this ill effect; although by skilful management it may be avoided. For instance, in the portrait, by a judicious casting of shadows, and arrangement of focus; in the landscape, by a change of position or the choice of a more favourable hour of the day;

and in the group—supposing the figures, as portraits, must each be rendered with equal care and prominence, by introducing furniture, or subordinate figures, which, acting as accessories, may serve to give breadth and unity to the larger, and more important group; for it does not follow that because a subject is crowded, therefore it must be *confused.*

Continuity.—The proper combinations of parts or unity of a picture is also accomplished by the law of continuity of which Ruskin says, "Another important and pleasurable way of expressing unity, is by giving some orderly succession to a number of objects more or less similar," adding, "If there be no change at all in the shape or size of the objects there is no continuity; there is only repetition—monotony."

Contour.—The actual shape or the ideal line indicated by position.

Contrast.—Nothing is more valuable to the artist than contrast; from it he derives his greatest power, and his most striking effects. To quote again from Ruskin, who says, in "The Elements of Drawing," that "the character of everything is best manifested by contrast. Rest can only be enjoyed after labour: sound, to be heard clearly, must rise out of silence; light is exhibited by darkness, darkness by light; and so on in all things. * * * Every form and line may be made more striking to the eye by an opponent form or line near them; a curved line is set off by a straight one, a massive form by a slight one, and so on; and, in all good work, nearly double the value, which any given colour or form would have uncombined, is given to each by contrast; * * * but great painters do not commonly, or very visibly admit violent contrasts. They introduce it by stealth, and with intermediate links of tender change; allowing, indeed, the opposition to tell upon the mind as a surprise, but not as a shock." Circumstances may, however, arise in which even the most forcible of contrasts may be essential; but, as a rule, that art is best which best conceals the tools with which it is worked, and the photographer, if he does not seek the soot and whitewash order of production, and produces nature's truth of gradation, will very seldom, if ever, err on the score of too violent contrast.

Delicacy.—A quality expressed by beauty of gradation, and the absence of violent contrasts in light and shade.

Demi-tints.—Half tints separating yet uniting the lights and shadows. The extreme delicacy of some must render them frequently lost in negatives by careless development. To aid in their preservation, as much yellow light should be admitted into the dark-room as may be consistent with preserving the plate from actinic influence; and the development should be carried on with extreme caution. It is impossible in a very dark developing room to detect the more subtle gradations of tone which come and go in so short a time under the action of your developer.

Disposition.—The particular arrangement of the parts which constitute the whole; not, however, in the same sense as we infer by *composition* which is held to have a more spiritual significance. We speak—for instance—of the disposition of the drapery, or the accessories, &c., but not of the composition of the accessories or of the drapery.

Distribution.—A word which may possess some peculiar shade in its difference of meaning from that of *disposition*, but which difference I, nevertheless, certainly can't define.

Diversity.—Variety and contrast are essential to a picture, and may produce a very pleasing effect called *diversity*, which should always be so far apparent in your work as to destroy monotony without producing that which I have pointed out under the term *confused.*

Dryness.—A quality the photographer will, perhaps, best recognise as hardness, although I have too frequently heard it called sharpness by the inartistic.

Effect.—That portion of your picture which first and at once challenges attention, should be the effect of the whole. Of course this effect may find its focus in any part of the picture; but to that point all the rest should be subordinate, minor effects, however numerous, merely assisting the *one* effect, which is—par excellence—*the* effect of your picture. Every fragment of the work may have its due and particular effect; we may speak of a fine effect of light and shade, of colour, atmosphere, action, &c., &c., &c., but all such should be treated only with reference to the production of an effective whole.

Feeble.—A term which may be applied either to the conception, execution, or general effect of a picture. A want of vigour in the negative, producing a poor, tame, flat, and weak picture would be, in the photograph, the same which would be called *feebleness* in the picture.

Feeling.—The full meaning of this word can only be thoroughly appreciated by the artist. The painter artist—there are plenty of painters who are not artists, as there are artists who are not painters—has certain instinctive feelings associated with every surface, and every object he expresses. Watch him at his work, and you will see the expression vary as he moves from one portion of the canvas to another; now the lower eyelid swells, and a soft, tender, expression steals over the face; now the thought-laden brows draw nearer, while the wrinkles ripple over the before calm brow; and, presently a stern resolute air calls attention to the more firmly griped brush and more vigorous touches. These indicate that instinctive play of feeling to which so much is due in the finished work. The term *feeling*, however, not only indicates the mental emotion embodied direct from the artist, but also the feelings it conveys to the mind of the spectator. Again, it may be that one portion only of a picture displays this quality. Thus, we may say that such a work displays fine *feeling* for such a quality, but that other parts are deficient in *feeling*. In photography this is also the case. One photographer has a fine feeling for the depth, transparency, and lustrous surface of water, another for the expression of foliage in all its beautiful varieties, and another excels in the *feeling* with which he endows the sombre grey ruins, and crumbling relics of olden times. Such a quality then exists in the photograph as palpably as in the painting, and to its cultivation, by indefatigable study of nature and art, the photographer should earnestly devote himself. When such feelings as originate it come, they bring with them a world of fairy pleasures, which alone are a rich reward for "the wooing o' 'it." An old friend of mine, whose paintings had certain very prominent peculiarities in the days when his miniatures were in repute, some few years since practised photography. When I saw his productions I was amazed to find his photographic miniatures were the exact counterparts of his ivory miniatures; although the latter had qualities you would hardly look for in the former, and the former were, as the catalogues say, "untouched." I could point out several instances in which the peculiar feelings of the artist were prominent in both photographs and paintings produced by the same hand, and our photographic exhibitions will bear me out in asserting that the distinctive characteristics of the photographs they contain are almost as numerous as the exhibitors themselves.

Scientific Gossip.

WE have on several occasions drawn our readers' attention to the important subject of the spectra of artificial light, and while most other journals have been at great pains to give all the credit of the recent spectrum *revivals*—we can hardly call them discoveries—to two German philosophers, we have felt it our duty to claim for our own countrymen the higher merit of having first explored these new fields of scientific research. Not that we wish to deprive MM. Bunsen and Kirchhoff of any fraction of the credit which is due to them. They deserve all praise for the perseverance and philosophical acumen which they have displayed in working out this difficult subject; but when a search through the standard scientific works to be met with in every good library would have shown that all which has recently come to us from the Continent as new was ten or fifteen years ago taken up, thoroughly investigated, and published in England, we think that some censure is deserved by those writers and scientific men who are now holding MM. Bunsen and Kirchhoff up to public admiration, without giving the slightest hint that *all* which these physicists have recently published has been previously made public by Talbot, Wheatstone, and Miller.

Of the labours of Talbot and Wheatstone, in this department of science, we have already spoken; of those of the latter physicist we now propose to allude. At the meeting of the British Association, held at Cambridge in the year 1845, Dr. W. A. Miller, Professor of Chemistry in King's College, read a paper entitled "Experiments and Observations on some cases of lines in the Prismatic Spectrum produced by the passage of light through coloured vapours and gases, and from certain coloured flames." The first part of this paper is devoted to an examination of the prismatic spectra of light that has been transmitted through various coloured vapours aud gases. Some of the results here obtained are unsurpassed iu interest by anything which has been more recently published on the same subject. Speaking of the remarkable, but now well-ascertained fact, that in the light of the afternoon and evening, lines become visible which at other times are not readily detected, the author relates the following curious circumstance. He was examining the spectrum of the diffused daylight towards the evening, when a violent thunder shower came on; immediately lines not before visible became distinctly apparent, and a group in the brightest part of the spectrum, betweeu D and E, though nearer to the former line, became very evident, increasiug in distinctness with the violence of the shower; as the rain passed away they again faded and disappeared. This observation will remind our readers of the remarkable results published by Professor C. Piazzi Smyth, in the Report on his Teneriffe Astronomical Experiment, a full account of which appeared in some of the early numbers of the Photographic News. In these observations on the solar spectra mention is made on several occasions of a line between D and E, which came into view as the sun got low on the horizon, and appeared to "grow" before the eyes of the observer as the light passed through a greater length of atmosphere.

The general impression has been that this growiug line, drawings of which are given by Professor Smyth in different stages of its development, is due to the absorptive action of the atmosphere. Dr. Miller's observation seems, however, to prove that it is caused by aqueous vapour. Several other beautiful results are also given, but although these are very valuable from a chemical point of view, they are not of such immediate interest as those described in the second part, where Dr. Miller treats of his experiments on coloured flames. An alcoholic solution of the compound under examination was made, and this was burnt in a spirit lamp by means of a cotton wick. The lamp was placed opposite the slit iu a tin box, the side of which, next the slit, was permanently open, whilst the opposite side was furnished with a door opening upwards and outwards, so that by a string it could be raised to admit the light of day, and would afterwards close by its own weight when allowed to fall back, Fraunhofer's lines thus served as points of comparison. In this manner the spectra of several metals were examined, and drawings of them given; and our readers will perhaps be surprised to hear that after making allowance for the imperfect state of chromolithography sixteen years ago, Professor Miller's diagrams are *more accurate* in several respects than the coloured spectra figured in recent numbers of the scientific periodicals. In corroboration of this we need only refer to the drawing of the calcium spectrum as given by Professor Miller. In it is prominently given the dark blue or indigo line, which has not been noticed by Bunsen and Kirchhoff. In the description of the calcium spectrum the author likewise states that in addition to the other lines there is a very bright streak in the indigo. A curious circumstance is connected with this blue line of calcium. Two of our most expert and rising young chemists having examined the residues left by some deep well water upon boiling, found, when this deposit was properly introduced into the spectrum apparatus, that, in addition to the well known red and green lines due to calcium, there sometimes appeared a bright blue liue. Upon referring to the coloured maps of artificial spectra given by MM. Bunsen and Kirchhoff to accompany their elaborate memoir on the subject, no trace of such a line was perceived as being given by any of the metals. This being the case, they considered themselves justified in announcing that a new element of the calcium group of metals existed, the characteristic test of which was the production of a bright line in the blue part of the spectrum. Immediately upon the publication of this another chemist showed them that this blue line was not due to a new element, but that it was a normal constituent of the calcium spectrum, which had been in the most unaccountable manner overlooked by MM. Bunsen and Kirchhoff. So far nothing extraordinary is noticeable. One chemist is led astray by an erroneous map, whilst another points out that the map is not to be relied upon, and corrects the error. It is, however, very singular that in Dr. Miller's maps, published sixteen years ago, this line should have been properly pourtrayed, and it is still more strange that it should have been first published in one of the volumes of the *Philosophical Magazine*, the same journal which last year gave to the English public the first account of the recent labours of the Continental savans. We frequently hear of the rediscovery of old facts, but for the same journal to give in an early number an elaborate and illustrated memoir on an important subject; and then, in a subsequent number, to give, with all the honours due only to absolute originality, merely a less perfect edition of the former researches, is an occurrence almost without a parallel in the annals of scientific literature.

The new element, whose discovery by means of the spectrum was recently announced in these columns, has received the name of *Thallium* (a budding twig) as the green line which it communicates to the spectrum recalls vividly the beautiful green tint of young vegetation. Traces of the new body have been found in several specimens of native sulphur. What is supposed to be the element itself has also been separated by the discoverer, Mr. Crookes, in the form of a heavy black powder. A portion of this, so minute as to be almost imperceptible to the naked eye, introduced into the blue gas flame of the spectrum apparatus, gives rise to a green line of extraordinary purity and intensity, a piece the size of a small pin's head being most dazzling, and quite equal to the soda line in brilliancy.

PHOTO-SCULPTURE.

Photo-Sculpture is the name given to a new art invented by a young Belgian sculptor, M. François Willême, the nature of which may be imagined by the word employed to designate it. In the strict sense of the term it is a completely mechanical sculpture, effected without the aid of the hands or chisel of an artist, which, by the agency of photography, any one can execute without knowing how to draw or carve.

This apparent contradiction would seem to be a mystery without the explanation afforded by the inventor, but with this before us, we perceive very clearly that it is not, as might be supposed, an application of photography in which an image of an object is reproduced by a sculptor. M. Willême takes a sufficient number of photographs of the living or inert model, at given points of view, and combining these photographs, and tracing the contours in determined conditions with the first of the points of a pantagraph, obtains by means of the second points of the pantagraph on a mass of modelling clay a statue in relief exactly similar to the model of the same, or of larger or smaller dimensions, in any proportion required. We do not say that the execution of this process is easy, yet with sufficient dexterity it will doubtless become, sooner or later a practical operation to any one accustomed to artistic manipulations, or the technics of the plastic art. The following is M. Willême's method of operating. He places the model in the centre of a circular platform upon which are arranged a sufficient number of objectives of equal power, focus, &c., and placed at the same level, or upon which a camera can be made to traverse in a circle round the model, and in this manner several different views are taken. For simplicity sake we will suppose these photographs to be only four in number, taken, in relation to each other, at 90 degrees apart, and giving, 1st, A, the face; 2nd, B, the right profile; 3rd, C, the back; and the 4th, D, the left profile. The plastic material, hard or soft, but which we will suppose to be soft, is placed on a platform, the circumference of which is divided into as many equal parts as there have been different photographs taken, in the case under consideration, these will be four in number. Two equi-distant tablets, placed vertically, but in planes rectangular or perpendicular to each other, carry—one, the view A, of the face; the other the right profile, B. For these two photographs to be identically and symmetrically placed, the tablets, as well as the photographs, are divided by a double system of horizontal and vertical lines which render the centring and the orientation easy. The two points of a first pantograph are now applied; the one upon the photograph A, of which it follows all the contours; the other upon the soft mass which it cuts into gradually so as to trace a *silhouette*, which is the faithful copy of the silhouette given by the photograph A; a second pantograph at right angles with the first, the point of which follows the photograph B, and the other point of which acts upon the block of soft clay, produces the exact silhouette of the right profile. At the same time, the second points of the two other rectangular pantographs, the first points of which are guided in the same manner by the photographs C and D, design upon the block the silhouettes of the back and left profile. Evidently four silhouettes will not suffice to effect the complete reproduction of the model; the block of clay, after these four operations, will still remain an unformed block; but there is nothing to prevent eight, twelve, fifteen, four-and-twenty or more photographs being taken, instead of four only; a number, in fact, necessary for the reproduction of the external contours in a sufficiently continuous manner, for only a few small protuberances to remain, which may be removed by the hand. In any case, the number of images will be divisible by four; twenty-four is a very convenient number, and quite sufficient; each of the photographs will be numbered in order, from 1 to 24. The turning platform bearing the block of clay will also be divided into twenty-four parts; the photographs upon which the two pantographs act simultaneously will be such as have been taken at a right angle, or at 90 degrees from each other; 1 and 7; 2 and 8; 3 and 9; up to 6 and 24, and every time the tablets received a fresh proof the platform will be turned one division.

But this series of four-and-twenty operations gives only the exernal contours, and the statue will not be complete until the interior contours of the ears, nostrils, &c., are produced. M. Willême obtains these in making the points of the pantograph follow, not only the profiles, but the lines of the light and shade which depict these reliefs and hollows.

The principle of the operations of photo-sculpture being established, its various applications may next be taken into consideration. If the photographic images be taken on some elastic material, as caoutchouc, for instance, deformed or caricature sculptures may be produced; again, by the aid of the electric light, the shadows of a model may be thrown on the tablets on which the photographic proofs are placed, and the latter dispensed with.

Or, according to an ingenious suggestion of the Abbé Moigno, Mr. Willême's photo-sculpture may be attained by a variation in the method above described. Imagine a statue placed vertically, and suppose that through the vertical and central axis of the statue we pass a series of planes, also vertical; each of these planes will cut the statue through one of its silhouettes; the total of these silhouettes constitute precisely the entire contour on the whole of the external forms of the statue. By virtue of the law of continuity it will not be necessary, in order to reconstruct the statue, to have an indefinite number of all these silhouettes, it will suffice to have a certain number of them, forty-eight, for example.

Being in possession of these forty-eight silhouettes, nothing can be more easy, taking them as patterns, than to reproduce the statue. We may also, without difficulty, perceive, that in cutting some planks with a continuous saw (following the silhouettes), the contours of which will be precisely like those of the outlines taken from the statue by the forty-eight sections through the axis; that in grouping and glueing these forty-eight planks around a vertical axis, we shall mechanically reproduce the statue. The continuous saw permits also of our obtaining forty-eight blocks of wood, which in their entire thickness represent these forty-eight silhouettes; and a common saw suffices to divide these blocks into a great number of planks, fifty for example, all bearing the same profile. Hence the simultaneous automatic reproduction of the fifty copies of the original statue.

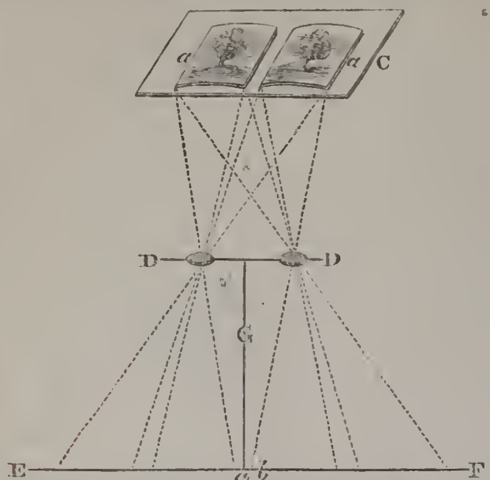
When we consider that these silhouettes, which we can obtain by the saw only from an inert material, photography can supply without difficulty, even from the living model, then photo-sculpture will not appear a visionary affair. In fact, this new mode of mechanical and automatic sculpture is completely realized. Mr. Willême has exhibited a charming statue in wood. obtained by his process, which he can multiply indefinitely, and which a very skilful and critical sculptor pronounces perfect.

STEREOGRAPHS ON GLASS.

BY COLEMAN SELLERS.

TRANSPARENT glass pictures have usually been produced by contact printing on dry collodion plates, and, to bring the pictures in proper position, negatives taken with a binocular camera are cut apart and reversed. This plan has many objections, and few amateurs have been successful in the production of transparent proofs. A decided improvement has been the introduction of the camera and the substitution of the wet collodion plate for the dry one. As so little has been written on this subject, I feel emboldened to offer to your readers a plain statement of a process which has enabled me to make glass pictures more rapidly than I can print on paper. The instrument I use for the purpose is a pair of Jamin lenses, mounted on a bellows camera, which has a slide for vertical adjustment in front, and slides moving horizontally to adjust the lenses to or from each other sideways. My lenses have the view-attachment, and out-door pictures are taken with this attachment in preference to using the portrait combination with small diaphragm. I have made a rough box, which, added to the bellows-box, enables me to draw out to fourteen inches from the tubes to the focussing glass. I have also arranged a board, about four feet long and two inches wider than the camera box, having cleats nailed along its edges to form a track to slide the camera backward and forward. At tho end of this board is nailed an upright board, having an opening made in it large enough to receive a stereoscopic negative, with little buttons to hold it firmly in its place. To understand how this apparatus is to be used, it is necessary to bear in mind that all combinations of convex lenses in cameras have the property of inverting the image, and not only turning it upside down, but reversing it sideways as well.

Referring to the annexed diagram, in which *C* represents a negative taken with a binoclar camera, and the prints from which, to be viewed stereoscopically, must be cut apart and reversed; that is, the lines *a* and *b* be brought next to one another. *DD* are the two lenses of the binocular camera, *G* the diaphragm in the box, and the line *EF* represents the focussing glass. If, now, light transmitted through the negative be made to pass through the two lenses to the ground-glass, the two pictures will be found to



be reversed, and an examination of the dotted lines will show that in the produced image the lines *a* and *b* will have taken their place next to each other, and from the uncut negative will be produced an image on the focussing glass ready for the stereoscope. If the lenses are moved sideways, the images can be made to approach or recede from each other, and can thus be properly spaced on the glass.

Having thus arranged the apparatus, it is only necessary to place the negative end of this box next an open window, and pointed towards a clear sky; the space between the upright board holding the negative and the camera box should be covered in with black cloth, to exclude all rays except those that pass through the negative. If the negative be placed with the film side away from the camera, a picture will be produced that must be viewed from the glass side of the plate, and which, backed with a ground-glass and bound around its edges, is ready for the stereoscope; while, if the collodion side of the negative is turned towards the camera, the picture will have to be viewed with the film side next to the observer. Two vertical lines can be drawn with a lead pencil on the focussing glass, about two inches and seven-eighths apart, corresponding to the centres of the two pictures; these are to help in spacing the pictures.

Thus, if it be a portrait that is being produced, let the nose, or some other feature, be cut by the line in the same manner in each picture; this will, of course, bring them two inches and seven-eighths apart. The size of the picture can be regulated by the distance the tubes are placed from the negative and the length of the camera box. It need scarcely be observed that, having a satisfactory image on the focussing plate, it remains only to substitute a wet collodion plate precisely as if an ordinary picture was to be taken. Length of exposure will depend upon the intensity of the negative, amount of light, and the kind of tubes used. I use my portrait-combination for this copying purpose, slipping a paper diaphragm with a five-eighth aperture in front of the object-lens of each.

The picture produced should be cleared with cyanide in preference to hyposulphite of soda, and toned with a solution of bichloride of mercury in water, and then coated with albumen prepared as for a Fothergill plate; this serves as a varnish and secures the film from cracking up in drying.

The chief advantage to be derived from this process of making glass stereographs is, that as soon as a negative has been taken and dried, it can, without any danger of scratching it, be placed in the copying box as above described, and, when once focussed, as many pictures can be made from it as you please; and, as rapidly as you can flow, sensitize your plates and expose them. — *Humphrey's Journal.*

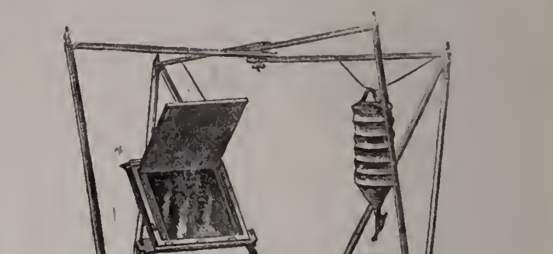
Apparatus.

SMART'S TENT.

As the season for landscape photography is rapidly advancing, we propose to describe from time to time the various tents, developing boxes, and other contrivances for working wet processes in the field; both those which are in the market and those of amateurs which appear to possess especial points of value. We shall be glad to receive from our readers and correspondents any hints on contrivances of their own of this kind, or of the results of their experience in the working of those already before the public.

As we have received repeated enquiries on the subject of Smart's tent, we shall commence by describing it. This is one of the largest and most convenient tents we have seen, ample space and ventilation being provided for working large plates without difficulty. It is in no sense a box, as some tents might perhaps be correctly designated; but a tent in which the covering comes down to the ground, and forms a rectangular apartment of six feet high, and three feet wide and deep.

The engraving below shows the interior with its equipment, prepared for operations.



As will be seen, the framework consists of a complete system of triangles, by which the greatest possible rigidity and strength is obtained with the slightest possible materials. The long rods which cross each other forming the supports, are each in two pieces, fitting into each other by means of springs and sockets. Every joint in the framework is readily matched to its fellow by means of an ingenious series of red and black marks, which by their arrangement prevent the chance of mistake. Three feet from the ground, just at the point of crossing, in the supports, is a table which folds up when the tent is packed, and when opened out gives a space for working on of three feet by one foot and a half. This space is encumbered with the least possible number of working appliances, as the bath is hooked on to the front edge of the table, and there is a neat contrivance for holding the dark-slide in one corner just above the table. This arrangement, for keeping the dark-slide off the table, is exceedingly convenient. One of the greatest difficulties of working plates larger than stereoscopic size in a dark tent, arises from the awkwardness of having to place a large slide, with the back open, upon a table already filled with bottles, bath, measures, and trays. As the dark-slide is placed here the plate is easily placed in it whilst in position: and on returning, to develop, it is replaced in its corner, the back lifted, and the plate received on to a pneumatic holder, without ever touching it with the fingers. At the opposite corner a collapsible water bottle is suspended with a spring tap, upon the pressure of which the water for washing the plate after development is readily made to cover the plate. A folding tray of india-rubber cloth, with fixed rigid sides, and moveable ends, which, on being put in their places distend it to proper shape, is provided for catching the waste solutions. The cover is quite impervious to light, except the nonactinic light passing through the window of yellow oiled silk. It is attached very conveniently to the frame-work, and held down at the bottom by means of eyes, into which the ends of the legs are placed. For use in windy weather a steadying line is attached to the top of the tent, which may be pinned to the ground on the windward side. The whole arrangement of the tent and its accessories is very ingenious and convenient.

When fixed in the field nothing appears wanting to its completeness as a dark-room. Its only drawbacks, in our estimation, are not drawbacks *per se;* but only so in relation to the wants of some photographers. The first is its weight; this is exceedingly trifling when compared with its extent and convenience, being, when packed up complete, only about twenty pounds. But to the photographer who is anxious to carry his traps for a day's work in his hand, this weight, together with camera, &c., would be quite out of the question to carry. The next drawback is one which really has no relation at all to the tent in itself, and we only refer to it because it is necessarily a point of importance to some of our young readers: we refer to the price. This, we have no doubt, is very moderate in relation to its value; but a cost of six guineas will necessarily limit its use to those to whom thorough efficiency is a more important consideration than the first cost of their apparatus. We have carefully examined the tent, and we are familiar with the pictures of Mr. Vernon Heath and others, the negatives of which, 12 in. by 10 in., have been produced in these tents; and, so far as we can judge without actual experiment, should think, that little more difficulty need be experienced in doing good work in the field, with such convenience than in the dark-room at home.

A CONVENIENT TOURIST'S CAMERA.

WE have just had made for us, by Mr. Meagher, a very neat and comprehensive portable camera for the field, which, as it possesses many points of utility and convenience, whilst, not perhaps new in themselves, we have not before met with in combination, we shall describe for the benefit of our readers.

It is intended for stereoscopic plates, and for plates of $7\frac{1}{2}$ inches by 5 inches, the outside measurement, when packed up, being about 9 inches by 8 inches, and 4 inches deep. It has a bellows body, expanding from a focus of $3\frac{1}{2}$ inches to $9\frac{1}{2}$ inches; thus allowing of the use of Dallmeyer's, Ross's, or similar stereoscopic lenses of short focus: or of the same lenses where only the front lens of the combination is used, having a focus of 6 inches. It also permits of the copying of objects and camera printing of transparencies the full size, by using the combination and extending the camera to 9 inches, which is double the equivalent focus. When stereoscopic pictures are not required, there is an extra front, to which is attached one of Dallmeyer's triple achromatic lenses of $7\frac{8}{10}$ inches focus, producing a negative of upwards of 6 inches by 5 inches.

When not in use for stereoscopic work the central partition is removed from the camera. The front may not only be raised, but also depressed, so as to allow of either more sky or more foreground, as the exigencies of the picture may require. The focussing screen is never removed from the camera, but hinged at the top, and turned back on the top of the camera; so that there is no danger of its being either broken, or laid down and forgotten. The dark frames carrying the plate enter at the side of the camera, and the slide pulling out horizontally, there is not the same danger of light striking in as when it is pulled out from the top. The focussing is effected from behind by means of the screw arrangement, the handle or winch is fixed instead of moveable, and folds up out of the way. The tail-board is hinged and folds up, thus protecting the ground-glass, and making the camera into a compact mahogany box of the size we have before mentioned. There was some difficulty effecting the union of the two advantages of a hinged tail-board and screw-focussing adjustment, which we were anxious to secure; but Mr. Meagher eventually managed it very cleverly. The tail-board is held rigidly in position both when folded up and when down, for use by side-pieces moving on a centre. Altogether the camera works well; it is rigid and firm; and none of the advantages are obtained at the expense of disadvantages. It is light and portable, and convenient to work; easily put into working trim, and easily packed up again, whilst, at scarcely any extra cost of weight or space, facilities for working plates 7 inches by 5 are obtained in a stereoscopic equipment, an arrangement adopted, we believe, by Mr. Wilson, of Aberdeen, in his stereoscopic camera.

We may here mention a convenient binocular camera for stereoscopic purposes only, which Mr. Meagher has recently brought under our notice. Unlike the ingenious binocular camera of Mr. Hare, which has two distinct bodies, this has merely one large bellows, the division between the two pictures in the bellows being managed by means of elastic material, which collapses or expands with the movement of the bellows. This camera, like the one we have described of our own, has a hinged-focussing screen, screw adjustment for focussing, hinged tail-board and other conveniences. It has also an ingenious swing-back arrangement, that part of the body receiving the dark-slide moving on a centre, which the flexible bellows readily allows it to do. The body expands from $3\frac{1}{2}$ inches to $7\frac{1}{2}$ for lenses of short and long foci. It is light, compact, portable, and complete.

Photographic Tourist.

PHOTOGRAPHIC RAMBLES IN WALES.—No. 2.*

BY J. H. JONES.

THE next morning, finding upon inquiries that there was nothing of very great attraction, until I should get to Ystalyfera, a distance of six miles, I thought I would take a walk while waiting for a conveyance, and so I started in search of a medicinal spring, discovered about three years ago, about which Madame Rumour had said a great deal, and which is now known far and near by the name of the Gellyowen Spa; the road to it is up a hill to the left of the Pontardawe road, which I ascended for about two miles; I did not take the camera with me, for which I was sorry, because many a beautiful view

* Continued from p. 213.

was to be had, some of them I should have liked very much. When I reached the summit of the hill I was rather surprised, for on loking around me, to see the whereabouts of a certain house, called the *Gellyonen Spa Hotel*, I could see nothing but a rough looking cottage, and an Unitarian chapel, *it could not be the latter, of course*, therefore, it must be the former; but not caring to be satisfied on the subject, I began searching for the spring, which after many a jump and leap—for the ground is nothing but a swamp—I discovered it lies in a trench, or gully, about four feet deep, about midway between the said cottage and chapel. The smell of the sulphur as I approached it was nearly suffocating, and for a time I could not pluck up courage to taste it, for I thought to myself, well, if the smell is so bad what must the taste be; but at last I summed up my resolution and tasted it, oh! it is not so bad as I imagined! I therefore, to follow out the proper prescription, which is, to "*drink half a pint and then run a mile*," I did so, and then, as fast as I could scamper, off I bolted towards the chapel.

As I entered the graveyard a feeling of awe took possession of me, for here I was alone with the dead, the solemn stillness reigning around added to this feeling; so after spending a few minutes in looking at and reading the inscriptions on the graves, I returned, and once more drank off the waters of the spring; this spring, in my opinion, gains its medicinal property from the surrounding swamp, for the ground is nothing but one mass of decayed vegetation; I tasted of several of the pools in the neighbourhood of the spring, all of which had a peculiar taste; these pools, having no visible outlet must, in my opinion, percolate through the ground, and find their way to the opening of the spring, which is a deep long gully much in shape like the drains in a meadow. I now made the best of my way back to the village, and got there just in time to meet the conveyance I expected.

Although there is nothing of very great interest, still the drive from here to Ystalyfera was very pleasant indeed; the road lying through a series of villages more or less pleasing, and the amusing tales told by the Jehu, a lively sort of fellow, served to pass the time away very pleasantly.

Alighting at Ystalyfera I looked around me, and soon found something to fire a plate at, in the shape of three bridges, a railway bridge, a canal bridge, and a large five-arched bridge crossing the river, through the arches of which the previous two could be seen.

Midway between here and Ystradgynlais, at which place I intended stopping, there are several very nice views to be had; one especially struck me as very beautiful, a small and very old bridge, which spans the canal near Ynyscedwyn House, the seat of Mr. Gough, and the turnpike road and canal running side by side, luxuriantly fringed with trees, through which a flood of golden light from the declining sun lit up a group of colliers who were filling the coal barges.

Finding by inquiries that the walk by the side of the canal was the shortest, I took it, and passed many a charming scene, until I arrived at the village of Ystradgynlais, which is most delightfully situated, I made my way to the Ynyscedwyn Arms, a favourite resort of the tourist, and also the commercial travellers who come to this vale on pleasure or business, a house where every accommodation can be had. As I spent six weeks in this village, exploring the beauties of the neighbourhood, perhaps it will not be amiss, therefore, if I subjoin a list of how this valley should be worked, for the benefit of those who might wish to visit it. First day, from Swansea to Pontardawe; second day, the local views as I have described them, in and near Pontardawe; third day, from Pontardawe to Ystradgynlais; fourth day, the local views to the east and south of the village, amongst which will be found the Ynyscedwyn Iron Works, the residence of the proprietor, a handsome structure called the *Plas*, also the church, and a splendid view of the valley—embracing many points of interest—from a hill on the Brecnockshire road; a few hours might also be spent very agreeably in the evening at the Iron Works; fifth day, a ramble to the north of the village, through Cwm Gaer and Tir-y-cwn, the last, a most delightful glen, the property of the Rev. Thomas Williams, a relative of the Williamses of Aberpergwm, in the Neath Valley—who is a gentleman of unbounded hospitality. This glen is deserving of especial attention, as it possesses many scenes of romantic and delightful grandeur, nature seems to have lavished its beauties here with no niggardly hand. The sixth day might be very pleasantly and usefully employed in following the course of the canal upward, until you arrive at the Brecnockshire road; as you approach the Black Mountain, from which the Tawe springs, a scene singularly beautiful appears before you; the wildness of the crags pointing and projecting in every conceivable form, is contrasted with the incipient foliage immediately below. The source of the river is very near the pathway over the mountain; the new-born stream rushes impetuously over pebbles and fragments of rock, until collecting itself into a basin, just above the fall, from which it makes a mighty leap of eighty feet to its bed below, forming a splendid fall, known by the name of Schood-yr-Henrydd. Three or four pictures of great beauty may be had here; the river then seems to derive fresh force from the steepness of its descent, rather than from the volume of water, which shapes its confined but everlasting course. The early progress of this river seemed to me much more pictueresque than that of the Usk, though little known and less celebrated; this vale, even in the upper part, has an aspect uncommon to such districts, in being studded with white cottages, this circumstance communicates a pleasing gaiety to the otherwise sequestered dell, overshadowed with mountains rising above mountains, in the rude and fantastical majesty of fashionless variety. The grand depository of lime which these mountains furnish for the use of the more populous and cultivated parts, with the facility of its conveyance down the neighbouring canal, sufficiently accounts for the sprinkling of inhabitants, who would not otherwise have sought so bewildered and inclement a spot. But the most romantic part, and greatest curiosity, of this extraordinary neighbourhood is the Cribbath Lime Rock; it rears itself perpendicularly to an immense height, with frequent projections of seemingly decumbent fragments. The abruptness of this, like most of the rocks, standing singly, unencumbered by lower hillocks at its base, occasion the scenery here to resemble greatly that of North Wales.

The river on reaching the level of the vale, assumes a beauty nearly equalling the most distinguished streams of this well-watered country. It is remarkably sinuous in its course, through meadows rich in verdure, and woods luxuriant in growth and foliage. In returning, the road is romantically overhung and confined between the noble woods on the slope and the river running at the bottom; many picturesque "tit-bits" may be had along this road. But the view from the half-demolished wooden bridge, up the river, with the loftier mountains terminating the distance, is uncommonly beautiful. If the night could be spent here it would be worth while, for this scene is particularly beautiful by moonlight, and would well repay the extra inconvenience attending the stay, for the soft and mellow colour, the interesting obscurity, by which objects derive an ideal importance from their indistinctness, the luminousness of the water, reflecting the silvery beams, all conspire to render a night scene in such a region most irresistibly fascinating.

I cannot conclude this paper without expressing a wish that the untamed beauty of these hallowed retreats, may long be preserved from the invasion of business, and the profanation of the engineer, unless the interests of agriculture or commerce were to be very extensively benefited by the introduction of busy human labour among the sports of nature; and also to express my gratitude for the many, very many tokens of kindness which I received from those friends into whose company I was thrown during my sojourn in the Swansea Valley.

Perhaps as an "Appendix" the following may prove interesting. A few days after my arrival at Ystradgynlais, whenever I went out with the camera, I was assailed on all sides by the inhabitants—men, women, and children—whom I should meet, who, after dropping a curtsey or scraping a bow, would say, "Drag my picture, Sir;" at first I could not understand what they meant by it; but when I was told that the word "drag" was intended for "draw," I had a hearty laugh. There was also a little boy, who, as regularly as the day would come, would be waiting for me, and directly he would see me, would say "*a lluniad*," and would follow me wherever I went, and, no matter how far, or how long I stayed, would be sure to return with me; whether this was done out of curiosity, or for the few coppers I gave him, I cannot tell, but very useful indeed was little Dan, and added a charm to many of my pictures by the natural childlike ways in which he would place himself for my convenience. I shall never forget the look of astonishment, wonder, and curiosity, which exhibited itself on his face, when I showed him a print of a negative, in which he sat on a stone near a waterfall; with his fat chubby hand he pointed to himself in the picture, and cried "Dan's lluniad," and then to the fall, and cried "*Gor Cwmpa*," and then off he went, and collected a lot of boys to come and look at it.

Correspondence.

PHOTOGRAPHY IN GERMANY.

Elberfeld, 17th May, 1861.

I REGRET to have to inform you of the death of one our most esteemed and skilful photographers, F. von Radl, Bart., of Augsburg, late member of the Council of the General Association of German Photographers, and chief of a large photographic institution. Some days before his death he sent to the *Photographisches Archiv* an article "On the Positive Paper Process," of which I will give you a short *resumé*.

Beyond the bad washing of positive prints there are yet a certain number of causes acting detrimentally upon the proofs. One of these causes is to be found in the card upon which the copies are mounted.

Every photographer has remarked the many particles of iron contained in these cards. The paper is bleached by chlorine, a great deal of which remains in the paper. The cards are drawn through iron rollers when yet humid, the moisture attacks the iron and thus chloride of iron and small particles of iron are deposited in the surface of the card-paper; they attack the print and destroy it after some time. The manufacturers of paper should employ hyposulphite of alum for bleaching, because this preparation does not cause the development of acid, as chloride of lime does.

The difference between several sorts of positive paper must be taken into consideration. A strong salted paper must remain longer and upon a stronger nitrate bath, than a slightly salted one, or when many sheets of paper are to be sensitized during one day, the strong salted should be prepared first, and afterwards the slightly salted ones. I once sensitized a very fine surfaced paper upon my usual 50-grain bath, and got very dull, bad prints with it; but having reduced the strength of the bath to 30 grains per ounce, and sensitized only three minutes, instead of six, I got very surprising results. The strength of my nitrate bath is tested by the known areometer.

For one ounce of water I take:—

(*a*) Liesegang's arrowroot paper	...	48°
(*b*) Slightly albumenized	... ...	60° to 65°
(*c*) Highly „	... ...	70° to 75°

The arrowroot paper remains four minutes upon the bath, the albumenized five to six minutes.

The strength of the bath expressed in weights is this:—

(*a*) 1 oz. nitrate of silver	to	10 oz.	of water
(*b*) 1 „	„	8 „	„
(*c*) 1 „	„	6 to 7	„

I add some drops of nitric acid to the bath for arrowroot paper. I find the addition of citric acid is very valuable. The tone of the print becomes exceedingly clear and goes over to the violet; also the paper does not discolour so rapidly, especially when a little nitric acid is added; in this case the use of preservative cases may be spared.

I have often found that too strong baths are of no use for paper prints. After sensitizing I pour the discoloured bath into the bottle and add some China clay. I do not like, as Mr. Fry proposed, to dissolve the nitrate of silver in common water, because it contains so many different compositions, that very often a bath may be entirely spoiled by it. Every photographer should examine the quality of the water he uses for washing the prints.

For large reproductions of cartoons, paintings, &c., Mr. Albert, of Munich, has now introduced the development printing. He prints every day some hundreds of various productions of the art and of the finest description.

The Photographic Society of Vienna has now held two *séances*. Mr. Martin has been appointed president of this new society. The proceediugs offer no features of much interest.

M. Angerer, the excellent Vienna photographer, showed some enlarged portraits produced from visiting card negatives by the solar camera. For the small album portraits large objectives of short focus are now generally preferred, some of our first photographers are using lenses of 4 inches diameter, which cover only 4½ inches; but I think this is not necessary. I inclose a card portrait made by Nadar with a half-plate lens, it is sharp enough everywhere.

A small "Catechism of Photography," by Dr. Schnauss, has been published at Leipsic.

Last week I visited the new Exhibition of the Paris Photographic Society. The most important are the fine enlarged landscapes and portraits of the Count Olympe Aguado. Everything is perfect in his prints, the shadows are transparent, the lights quite full of half tone, and the whole is of a very plastic effect. I saw the Count at work in his private gallery of the Place Vendôme. He uses the ordinary Woodward's solar camera, and plain salted paper, which is exposed wet aud upon wet filtering paper. He lays the nitrate solution on the paper with a glass triangle.

The enlarged prints by Delessert are not sharp enough, and possess too great contrasts. Evidently his negatives are not adapted for enlargement. Another first-rate enlarged portrait is exhibited by Messrs. Mayer and Pierson. Very interesting also are the stereoscopic views of Messrs. Ferrier, made with Dallmeyer's new stereoscopic apparatus; the pictures of the "Boulevard de Sebastopol" are surely taken instantaneously, every figure, carriage, &c., being perfectly sharp. The proofs have been made upon albumenized glass plates. Some days ago I made myself several instantaneous views of streets, and must confess this apparatus works excellently.

The best portraits and views exhibited by foreign photographers are those of Claudet, Maxwell Lyte, and Angerer. Another German artist, now living at Paris, Mr. Hanfstängl, has sent some excellent portraits.

The *carte de visite* portraits are exhibited in large numbers by Mayer, Ken, Pesme, and Pierre Petit.

Altogether more than 1,400 prints are exhibited by 150 photographers. PAUL E. LIESEGANG.

PHOTOGRAPHY IN THE TROPICS.

Rio de Janeiro, April 6, 1861.

DEAR SIR,—I have often seen in the PHOTOGRAPHIC NEWS letters from correspondents in respect to "toning difficulties." These have always astonished me, never having had any failures in my own practice. You may fancy then my astonishment when my last batch of prints turned out a complete failure. I have always followed the instructions given by "R." in No. 70 of the NEWS. I turn fifteen grains of chloride of gold into the auro-chloride, keeping the solution in a stock bottle, using as occasion offers in the proportion of one drachm to four ounces of filtered water (not distilled). About three weeks since I prepared a fresh solution of the auro-chloride, of which I used one drachm; the prints toning perfectly. A few days ago I printed twenty stereograms, and mixing the usual bath, I was greatly surprised to find it apparently inoperative; thinking I must have made some mistake, after fifteen minutes or so had elapsed, I well washed the prints, threw away the bath, washed dish and measures, and, mixing one drachm of the auro-chloride solution with four ounces of water, replaced many of the prints. Those that had been the least over-printed, I kept back. Most of these are of an even brown tone, such as I have generally obtained by only a very slight immersion in the toning bath; others very unequal—brown in places—purple in other parts. As an example, I send No. 1. The new bath had no more effect than the previous one. I left the prints in it for *two hours*, and then washed and fixed No. 2, with the intention of asking your opinion. The bath seemed to have no *bleaching* effect at all; indeed, this print appears more over-printed than it did when removed from the printing-frame. Half the prints were taken on the paper I had previously been working with, the other half on a new supply received from Messrs. Horne and Thornthwaite. But as I could detect no difference in the prints the change of paper can have had nothing to do with my failure. I have always been able to get either brown or black tones according to the extent to which the stereograms were over-printed. I send you two (Nos. 3 and 4) of the previous batch, when everything went well. They are the only ones I have left on hand, and they are far from being the best then produced.

If one of your correspondents who has been accustomed to photographing in hot climates would kindly give a few hints as to the best process and modes of manipulation, he would confer a great boon on many subscribers who, like myself, have but little time to devote to photography, and who have to blunder through innumerable failures on the road to success. Developing solutions, time of exposure, have all to be altered from what we have usually been accustomed to. The exposure is considerably longer than in England: for example, No. 4, taken in full sunshine, about 11 o'clock, a.m., with wet collodion, and Powell's Registered Stereoscopic Camera, and 4¼ inch focus lens, was exposed for 35 seconds, and this was certainly not too much. A snowy appearance is a very common defect in sunlit views in this country, in this case the white in the foreground is *sand*.

In many parts the roads have no hard surface, but are nothing more than bands of loose, glistening sand, with irregular patches of herbage springing up here and there at the sides, where the traffic does not interfere with its growth. No. 3 was taken with the same camera but on one of ———'s dry plates, exposure 5 minutes. Out of some dozens of these plates I have only succeeded in getting half-a-dozen passable negatives on account of blisters in the development which print as white spots. You will detect the presence of these spots on the distant mountains near the sky line.

After trying a tent for out-door photography, which was an entire failure, the heat being so excessive, I attempted to prepare dry plates of my own. I tried the collodio-albumen, but never could produce a plate free from stains when developed. They invariably reddened all over soon after the developer was applied. I afterwards prepared six Fothergill plates, with which I obtained one negative as fine as any I have, the others were failures only through under-exposure; they developed cleanly and not a stain could be detected on any of them even after prolonged development. I was now convinced I had hit upon the safe and easy process. I thereupon prepared a dozen plates with the intention of exposing the following morning (as on the previous occasion) a sudden change of weather came on and I was unable to do anything for a fortnight. I then took a turn amongst the hills; but on my return no sooner did I apply the developer than they immediately became stained. I next tried the albumen, only preparing four plates, the result was so unsatisfactory that I gave the process up as too difficult. The details came out very fine; but in each case the glass was more sensitive in one part than the other, through, I suppose, the albumen not having been properly applied so as to form an even coating. In despair I took to wet collodion again, and turned my tent into a developing chamber, by attaching in front two sleeves for my arms to pass through, and a small piece of yellow glass for seeing through; the view No. 4 was taken on the first occasion I experimented with it. It is rather awkward to work after this fashion, but it answers, and I suppose will become less awkward each time I use it. Still, for all that, a certain dry process would be a great desideratum, because with half-a-dozen extra slides then it is possible to go to many points for interesting stereograms where a tent is difficult to set up.

I hope you will excuse my rambling details by considering that as I am not within the boundaries of the penny post I am not bound to have my say out in as few words as possible.

How is it possible to produce a portrait of an individual with *light blue eyes?* Is there any dodge in printing from the negative, to bring the eyes out more decidedly?

What is the yellow varnish used for glazing over portions of a negative that print too deeply? and how is it applied?

Having only a day occasionally at my disposal, and having had but a very slight practical insight into photographic manipulation in England, I can't expect to produce anything very superior; but if a few stereograms, from time to time, of subjects such as Nos. 3 and 4, would be of ANY interest to you, I shall have much pleasure in remitting them.

With many apologies for taxing your patience with such a confused statement of my grievances. I am, dear sir, yours respectfully, William H. Cock, C.E.

[Your toning difficulty has probably arisen from adding excess of carbonate of soda to the chloride of gold. The solution thus formed will tone perfectly well at first, but on being kept, gradually loses its toning properties from the entire change of the chloride into an oxide of gold, which has no toning properties in the absence of any chloride of gold to commence the toning action. This is the theory of Mr. Hardwich. The best plan is to keep the chloride of gold in a solution of definite strength, and add the alkali at the time of using it. The plan is simple and avoids all risk. We strongly suspect that much of the difficulty experienced in working the collodion process in tropical climates, arises rather from the decomposition of the collodion than from diminished actinism. We should like our correspondent to try the effect of a bromo-iodized collodion, and iron development, and let us know the result. Regarding the dry plates referred to, we have ourselves worked them and never met with the difficulties to which our correspondent refers. The difficulties you meet with in the collodio-albumen and Fothergill processes appear to arise from insufficient washing; the stains seem to indicate the presence of free silver. You must bear in mind that no process, however perfect in itself, can be certain in result unless the manipulations are certainly perfect. The only method of successfully dealing with light blue eyes in a portrait, is to preserve them from excess of light, always take care to have them more or less in shadow, and looking at something in shadow. The use of any transparent yellow pigment ground in varnish would give a yellow varnish. Gamboge is a natural yellow varnish soluble either in water or alcohol. We have not ourselves "doctored" negatives in that manner, but it could be applied with a camel-hair pencil. The use of a little yellow powder-colour is sometimes useful in giving points of vigour to a negative. These things should always be regarded as final resources, not as constant and necessary aids. The views are decidedly interesting, and we shall have pleasure in receiving them and hearing of your further success.—Ed.]

PHOTOGRAPHY AND INTOLERANCE.

SIR,—In common, no doubt, with all your readers I rejoice at the stand made by the Chief Baron against the proposal to class our productions amongst mechanical appliances in the coming International Exhibition. It will be equally pleasant if a similar stand is made against the interference of certain individuals in the matter of portraits and artistic additions to landscapes, as the following fact will shew.

A friend of mine, when lately preparing to take a view of a church in B——shire, requested a girl of the village to place herself so as to be included in his picture; but no sooner had she done so, than the Clergyman issued from his Parsonage and drove her away in great wrath. He then, addressing my friend, said, "I would not have that girl in your picture for a hundred pounds!" To the very natural enquiry "Why so, sir?" he received the uncourteous answer, "Oh! she is a little nasty Dissenter." My friend might have with truth rejoined that he also was a Dissenter, though neither "little" nor "nasty;" but, jesting apart, this is a species of intolerance which deserves not only publicity but censure. Are church people alone to be included in our pictures? If so, we may be likely ere long to see a West-end portrait gallery with a notice "No Dissenters admitted," the exclusion extending even to Weslyans, as to this denomination the girl, it appears, belonged. I inclose my card, although an occasional correspondent and constant reader. Yours, ALIQUIS.

[We had hoped that photography was one of those catholic arts and sciences that made "the whole world kin." We should think this is a very solitary case.—ED.]

THE SOCIETY AND THE EXHIBITION OF 1862.

SIR,—Does it not strike you that a society which has done so little for photography as a fine art has scarcely the right to step forward with so much indignation, and protest so loudly when other bodies treat it with the same feeling as it has uniformly displayed towards the new art itself?

What has this London Photographic Society done to foster the artistic capabilities of photography, that it should complain of its productions being classed with its apparatus, and its processes?

We sadly want a society devoted to photography as an art as well as a science, and nothing has more clearly demonstrated this to my mind than the treatment it seems likely to receive at the hands of those who manage affairs for next year's Great Exhibition. I am, dear sir,

ONE WHO BETTER LOVES SMALL DEEDS THAN LARGE WORDS.

[We can scarcely regard the past shortcomings of the society as any barrier to its present activity in a right direction. We are so glad to see it alive to the interests of the art and its votaries, that we are almost willing to regard one virtuous action as condoning all past faults.—ED.]

Photographic Notes and Queries.

BACKGROUNDS.

SIR,—I write to inform you, for the benefit of those amateurs who may be in want of a background, that if they follow the directions given by Mr. Gulliver in a recent number of the NEWS, they will have no cause to regret the experiment.

I have made a most excellent background by the means described, which I have attached to a roller, and (for the sake of convenience) treated exactly as though it were a bliud; the cloth will, however, fold without cracking, as stated by Mr. Gulliver.—Yours truly, FRED. YOUNG.

Blackheath Road, May 20, 1861.

STAINS AND STREAKS.

SIR,—I have just read the NEWS, one result of which occupation has been a most inordinate and uncontrollable fit of cachinnation. I beg pardon, not for one moment do I insinuate ought approaching to disrespect to the author of the paper on "How to Prevent Stains and Streaks in the Collodion Negatives," but to be told in a most serious and positive manner that too much light in the dark-room is the main, if not the sole cause of the above blemishes, is rather too much for an individual like myself, whose nervous system is very easily and speedily affected. I most unhesitatingly add my humble testimony to the value of your own remarks on this paper, and in addition thereto would venture to ask our friend if the constitution of the iodising compound, or a collodion giving a thick or thin film (opaque or translucent) has anything to do with the subject in question? As regards myself, using *clean* plates, *I cannot get a streaky or stained one.* I work Mr. Thomas's collodion in a Horne and Thornthwaite's dark-tent, which latter, owing to a fair amount of wear and tear, and a rather "sloppy" manipulator, has become a little warped, and actinic light streams in (I was going to say) in all directions, a crack here, one there, and pin-holes in the calico innumerable, yet I will "set up" in the sun, and get a perfect picture without trouble. Now for two examples, and I conclude, stating firstly that if any one doubt I shall be happy to show the negatives. In the bottom of my tent is a hole to pass out the water, and which, when manipulating, is covered over with a penny piece, being handy; last winter, while developing a view of Rainham Church, Essex, I discovered, to my dismay, the hole was not stopped (and right under the plate) of course I thought the picture spoiled, nevertheless, it dried all that could be wished. Again, a few days since, I was photographing a gentleman's mansion, and the only available dark-room for large plates was the coach-house next the stable, developing by the feeble and deceptive light of a candle. I imagined the plate literally burnt to pieces, house and sky one mass, so prepared another and reared the picture (developer still on) against the wall. I thought, however, that a glance by daylight at the result would be advisable as a guide to density; to my surprise, the plate was perfect; I therefore washed, redeveloped up with pyro and silver, and very successfully concluded my morning's work. I state these facts more to prove that actinic light will not always stain and streak the plate so much as the reasons aforesaid, than to boast of any "dodge" in manipulation, and inclosing my card, remain sir, respectfully yours, PHOS.

COLOUR IN SPIRIT VARNISH.

SIR,—Can you or any of you readers inform me how to decolourise spirit varnish for collodion negatives?—Yours, ZENO.

[We believe there are no efficient means of decolourising spirit varnish. All gums have the tendency to acquire colour, and if applied in a colourless state would acquire colour on the negative. The very thin film, however, will scarcely exercise a detrimental influence in an appreciable degree.—ED.]

ON MOUNTING PRINTS.

SIR,—The mounting of prints being to me a troublesome and unpleasant process, I was induced to try the mixture given at p. 211 of your present volume, but unfortunately without enjoying the advantages promised by the writer of that article; on the contrary, I find that with his preparation the prints still "cockle," that wherever the mixture happens to touch the face of the print (an accident of frequent occurrence with unpractised hands), there the albumen surface is destroyed and the print seriously damaged; moreover, on opening the bottle today (a fortnight after mixing), I find the surface of the contents thickly covered with blue mould.

After trying various plans, my advice to brother amateurs, who have only to mount a few prints now and then, is, stick to fresh-mixed starch paste; there does not appear to be anything else so easily managed or so trustworthy. A good method of preparing starch paste was given some time back in the *Amateur Mechanic* series of papers. By the way, it seems to me that a practical article or two on the subject of attaching the print properly to its cardboard support, might be made really useful. The difficulty with stereo prints is but slight, the vexations increase with the size of the picture. "How to clean a plate" has long been a standing topic with societies in want of a subject; why not vary it a little by going to the opposite end of the matter, and teach us "how to mount a print?"—Yours very truly, D.

[We think our correspondent may in some respect have made a slight error in the preparation, as the method to which he refers was from a correspondent whose suggestions are always eminently practical and successful. Starch paste is, however, always safe and simple. We shall bear in mind the suggestion on the subject of mounting.—ED.]

Talk in the Studio.

Dr. Hill Norris's Extra Sensitive Dry Plates.—We exposed a couple of Dr. Hill Norris's extra quick dry plates a few days ago, which we had had about six months in our possession. They were in no way deteriorated from this length of keeping. They were both over-exposed with five seconds exposure. The sunlight was bright, and a stereo lens was used with half-inch stop. The only difference observed as the result of keeping was a considerable accession of redness in the negative, which is of a rich ruby tint.

Photographic Society of Scotland.—The annual meeting of this society was held on the 14th. The report shows the society to be in a prosperous state, a balance of upwards of £386 being in the hands of the treasurer. We shall give the report of the council next week.

North London Photographic Association.—The last meeting, before the summer recess, was held on Wednesday evening. A camera arranged with an especial view to the copying of engravings, was described by Mr. Barnard, and a paper on mounting stereographs was read by Mr. Shadbolt. A detailed report will appear in our next.

Photography on Wood.—The *London Review* has an interesting article on this subject, which does not, however, explain any process. A specimen engraving by Mr. Thomas Bolton is given, which is very effective. The subject is "Christ as the good Shepherd," being a copy of a stained-glass window recently erected in Abington Church, Northampton.

Photographic Enamelling.—M. Joubert recently read a paper on his method of producing photographic pictures in enamel colours on glass, at the Society of Arts.

Instantaneous Photographs.—We have received some specimens of a beautiful series of instantaneous photographs of Paris, just issued by the London Stereoscopic Company, executed by their talented artist, Mr. W. England. They, for the most part, represent scenes in the crowded streets of the French capital in the midst of its busy traffic. In many of them the conditions of complete instantaneity are perfectly fulfilled, for we have walking figures with foot uplifted beautifully rendered, and rapidly driven equipages produced without blurring. In addition to their interest as instantaneous pictures of scenes so full of subject as Parisian streets, they are harmonious photographs without the common enormity of white skies. There is in all cases a tone over the skies, and in some the natural clouds. The only point at all at fault, is the lens, which has not always given perfect sharpness and illumination to the edges, the results, we presume, of the large aperture necessary to instantaneous pictures.

To Correspondents.

T. K.—We have had no experience with Bland and Long's dry plates; but it is not improbable that after keeping for upwards of two years they may have become useless. Perhaps a direct application to that firm may gain you some information. The gallic acid solution of the colour of port wine, which has been kept mixed for two years, is quite useless. Your old collodion may probably be utilized by adding a bromide to it. Try first the addition of half a grain to each ounce; and if that is not sufficient add a grain. Use iron development with it.

N. W.—Mr. Barber's instructions are very definite. He says, add liquor potassa until a permanent precipitate is formed. The smallest amount of oxide thrown down and not redissolved is a permanent precipitate. We should have thought the term could not possibly have been misunderstood. The amount of nitric acid which may be present in any commercial sample of nitrate of silver, is altogether indefinite, some samples are nearly neutral, whilst others contain much nitric acid; it would be impossible, therefore, to say what amount of oxide of silver, or of any alkali would be necessary to neutralize it. If a large amount of oxide of silver were required to neutralize it, a large quantity of nitric acid must have been present. The amount of alkalinity present in a bath which has been neutralized with oxide of silver and filtered is so slight, that an infinitesimal portion of nitric acid would neutralize it. Possibly you are not sufficiently careful in your experiments, or you do not allow sufficient time for all the reactions to take place, before you draw conclusions. The most lucid instructions will be useless unless you exercise care and judgment.

Plato.—The print you forward is an excellent tone for those who desire black tones. Personally, we prefer them a little warmer. We see no reason to doubt that it has been produced by means of alkaline gold toning as we have ourselves produced, and often seen others produce, equally rich black tones by that method. Good paper, a strong silver bath, and a vigorous negative, are all that are required. This print has been produced from a very vigorous negative. Black tones cannot be produced from a weak negative, without losing the whites. *Rive* paper will be most likely to give you warm black tones, if you tone deep enough. Saxe paper readily gives black tones, but there is a tendency to the slatey coldness.

J. B. R.—Your name shall be inserted. Regarding the blistering to which you refer, we can only suggest two causes, using a contractile instead of a powdery collodion, or coating the plate when it is not perfectly clean or dry. The collodion you are using ought to be the very best, being supplied by such a successful manipulator. The other to which you refer we have no practical knowledge of, but we see no reason to regard it as an improvement on what you already have. Perhaps the use of a bath containing nitric acid, for the first exciting, may aid blistering.

T. P. E.—We see no reason why, with ordinary care, you should not succeed in making good collodion. The formulæ given in the Photographic News Almanac may be relied upon, as we use it ourselves practically. If you intend to make collodion, by all means begin at the beginning and make your own pyroxyline; it is upon that your success will mainly depend. We doubt whether there is such a thing as thoroughly good pyroxyline in the market for sale. The price at which it is often quoted in catalogues would be wholly inadequate to pay for the manufacture of a reliable article. Begin at the beginning and follow instructions carefully expecting the possibility of your first attempt or two not being entirely successful; but persevere until you get satisfactory results.

T. G.—We are obliged by your contrivance for the dark room window, which we will make use of shortly. We will enquire about the negatives to which you refer.

J. T.—The addition of acetate of silver to the bath would give you greater intensity; but we should recommend you in preference to use another collodion. Do you intensify at all before fixing? because the collodion you name would probably not give you sufficient intensity for negatives with iron development only. Ponting's collodion is generally accompanied by directions for the condition of bath most suitable for it, and is generally best developed with pyrogallic acid. Your specimen is very respectable for a beginner. For such a subject you should use a smaller stop; this picture appears to have been taken with nearly full aperture.

M. D.—Kinnear's camera with the improvements of either of the makers you name is a very useful article, and would do very well for copying. It is difficult to say whether its extension for focus is greater than that of ordinary bellows cameras, inasmuch as there is no standard length which can be described as ordinary; you can have them made to extend any length. The extension of a 10in. by 18in. Kinnear which we have in use, made by the latter of the makers you name, is about 16 inches. 2. We have not used a Voightlander's orthoscopic lens.

E. C. L.—In taking negatives to be intensified by means of bichloride of mercury, you may use your ordinary positive bath, and your ordinary positive collodion, if it give you a slight degree of intensity; if it give a very thin image add a little negative collodion to it. Develop with iron 15 grains, and glacial acetic acid 15 minims, to an ounce of water. Fix with hyposulphite of soda. Intensify with a weak solution of bichloride of mercury, say 3 grains to an ounce of water. Turn it yellow by means of a weak solution of iodide of potassium, say 1 or 2 grains to an ounce of water; or brown by means of dilute ammonia, one or two drops of liq. amm. fort. to an ounce of water. Varnish before using. Take care to expose sufficiently, and to wash well between the application of each fresh solution. The focus of a view lens is ascertained, as you mention, by focussing for a distant object, and measuring the distance of the lens from the ground glass. The equivalent focus of a portrait lens lies at a point somewhere between the front and back lenses of the combination. We have repeatedly given the means of ascertaining it. See Photographic News Almanac, p. 76.

G. H. E.—To prevent your prints becoming a cold black, do not leave them so long in the toning solution. Use the Rive paper, it is less liable to coldness than Saxe paper. The use of a little citric acid in your silver bath will also give you redder tones. The use of borax won't help you.

Jimby.—The mottling in the prints you send is simply the result of bad paper: so far as we can judge, that is the only cause. Try a Rive paper.

Jupiter A.—The streaks on your plate are caused by the condition of the bath, not by the developer. The addition of a little nitric acid may correct it. If not, add a little oxide of silver and place the bath in the sun for a few hours; then filter, and add nitric acid a drop at a time until it works, trying a plate each time. It ought then to give you brilliant positives. The developer you are now using has too much nitric acid. Use one drop instead of two. The defects in your collodion appear to arise from over iodising, the addition of a little plain collodion might put it right, or you may try adding a drop or two of distilled water to each ounce of collodion. Regarding the use of bichloride of mercury, see answer to E. C. L. Let us know of your success with your bath.

A Subscriber at the Hague.—Mr. Dawson's admirable table for ascertaining the strength of nitrate of silver solutions would be quite clear to you if you were familiar with the principle of "specific gravity." The subject is too long for explanation here. You will find it explained at p. 248 of our third volume, or in almost any elementary work on natural philosophy. Distilled water at 60° is the standard, and the specific gravity bottle holding 1000 grains of distilled water, will, when filled with the solution to be estimated, just give the results according to the silver the table indicates.

H. W. Ball.—The specimens sent do not indicate that your bath, or anything else, is out of order. You simply require a little shorter exposure. There are two or three methods by which you may get deeper blacks in your glass positives, that is, less deposit of silver on them. First, the addition of a little more nitric acid to your bath; second, the use of an older collodion; third, the addition to your collodion of a little tincture of iodine. It is often impossible for us to write letters by return of post, however anxious we may be to relieve our readers from difficulties. You will see this before we should have time to write to you.

F. E. G.—We are not familiar with the instrument to which you refer; but have seen very good negatives taken with it. We have received the specimens, but have not time to look at them; we hope to do so shortly. The stereograph is very good. We cannot say whether it is good enough for the purpose you name. We do not think much of the scheme.

G. W. Hale.—Certainty is rather a question of manipulation than of process, although some processes require less care to produce good results. We shall give another albumen process shortly; that used by Ferrier. We should imagine good views of Constantinople would sell. It would be desirable to have both stereoscopic pictures and larger ones. We admire the tone of your transparencies very much. You did not state how it was produced.

T. S.—All the advertisements you enclose are simply traps to catch the foolish. We have already more than once exposed "Lindorff's discovery." It simply consists in "setting off" an engraving newly printed in printer's ink, on to a piece of clean paper.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 144.—*June* 7, 1861.

M. FERRIER'S ALBUMEN PROCESS.

A singular controversy has recently occurred relative to the albumen process of M. Ferrier, whose exquisite transparencies have long been the admiration of photographers. Some half dozen years ago Mr. Negretti read a paper to the Photographic Society, which was published in the Society's *Journal*, describing an albumen process which had been communicated to him by M. Ferrier. Our Liverpool contemporary having recently published an article entitled "The Albumen Process of M. Ferrier, as practised by Mr. Negretti," which it appears was a *résumé* of the paper read in 1855, M. Ferrier emphatically denies that the process is his, or that he ever communicated it to Mr. Negretti. This gentleman, in his reply, mentions time and place when M. Ferrier explained his process, and showed it in operation, and moreover states that he had subsequently mentioned to M. Ferrier the fact of having detailed particulars to the Photographic Society, and that until this exhumation M. Ferrier neither disavowed the process, nor complained of its publication. He adds that so long as all manner of absurdities were published as to his method of working, and photographers were thus thrown off scent, M. Ferrier chuckled and held his peace; that he is a man who has never opened his lips to give photographers at large a hint, but allowed them, so far as he was concerned, to flounder about, wide of the mark; and that it is only since his, Mr. Negretti's, successful practice of the process, that M. Ferrier is concerned to deny it.

Just at this juncture, when Mr. Negretti's emphatic re-assertion of M. Ferrier's paternity regarding the process, and his own good faith in the matter, appeared to have set the matter at rest, doubts are re-awakened by the comments of an authority universally respected by photographers. Mr. Hardwich, in the same journal, expresses grave doubts as to whether the process published by Mr. Negretti is actually the one by which he produces the transparencies he issues, and asks him, in all plainness, for a definite answer on the subject, stating his conviction that unless Mr. Negretti makes a clean breast of this "he will be answerable for all the disappointments of the thousand and one amateurs and professionals, who, on the strength of his published successes, will weary themselves in the vain attempt to rival their teacher."

We remember an American story of a backwoodsman, doubtless of Milesian origin, who coming up to a spot where some fighting was going forward, regarding the origin or merits of which, or of the parties engaged in it, he knew nothing, at once inquired, "Is this a free fight?" and without waiting for an answer plunged into the thick of the *mêlée*. Now we have no disposition to emulate the belligerent backwoodsman; but as the subject in dispute is an interesting one to photographers, and as we think we can throw a little light upon it by independent evidence, we shall say a few words about the matter.

To refer to the latter part of the question first. We do not know what ground Mr. Hardwich may have for doubting that the process published is that now used in Mr. Negretti's establishment; but we have the assurance of a gentleman with unquestionable means of knowing, that the process, published by Mr. Negretti in 1855, was the one used for years in his establishment, and we have seen the transparencies so produced, which have all the characteristics of those now issued. We think it important here to reiterate what we have often before endeavoured to enforce; that less at any time belongs to a process than to the individual working it. No one dreams of doubting that the master-pieces of men like Williams or Bedford are produced by the wet collodion process. And yet it is well known that the vilest libels on the art are constantly perpetrated by the same process. A good process and reliable formulæ are unquestionably of vital importance; but certainty and success can come with no process without a patient and persevering compliance with the common-sense conditions of success.

Before remarking on the identity of the process with that of M. Ferrier, we will first give a brief epitome of Mr. Negretti's statement of formulæ and manipulations, which are as follows :—

To the albumen of ten fresh eggs, add one per cent. of iodide of ammonium, dissolved in twenty per cent. of distilled water: now beat up the albumen for about a quarter of an hour, till the whole is converted into a froth, so thick and hard that pieces may be pulled up bodily with the fork when plunged into it. The basin should now be carefully covered in with a sheet of paper to prevent the access of dust, and put aside for six hours. After the froth has subsided, a thick crust is formed at the top: this serves as a filter for the substratum of albumen, which has to force its way through the crust when being decanted from the basin on to the plate.

The dark room should be carefully freed from dust some two or three hours before it is used, the floor being watered and swept, and all shelves and ledges well wiped with a damp sponge; for dust is the principal cause of blemishes in the albumen film, and, to prevent disturbing it as much as possible, it is advisable to take in all material required at one time, just before commencing operations. It is desirable that the room should be kept at a moderate temperature, though this is not essential.

The plate holder is a round tapering stick, about half an inch in diameter and nine inches long, having at one end a small cup, about an inch in diameter. Round the edge of the cup, which is about a quarter of an inch thick, some gutta-percha is melted.

To coat the plate warm the gutta-percha of the plate-holder in the flame of a spirit lamp, then press it on the centre of the back of the plate: in a few seconds it will have cooled sufficiently to adhere firmly to the glass, so that it may be turned and whirled in any direction. Now hold up the plate, and with a soft flat brush remove any dust that may have stuck to the plate. Pour the albumen from the basin on to the plate in the same manner as if coating with collodion, and, if necessary, assist the even flowing with a glass rod. Drain the albumen off, first at one corner then at the other; tilt the plate, so that the fluid may again pass over it; again tilt the plate, and when the albumen has reached halfway across it, impart a rotatory motion to the glass by means of the holder worked between the hands; continue this for seven or eight seconds, then place the hand close under the plate and force it off the gutta-percha. If any dust fall upon the plate during the operation, draw a fine camel-hair pencil between the lips, and pick off any spots with the point. Place the plate in the drying box, in each alternate groove of which a board slides freely, so as to separate each plate one from the other. The inside of the box must be well dusted before use, and the boards cleaned and thoroughly dried before a fire or in the sun, so as to render them absorbent, otherwise the film will not dry easily.

The bath for sensitizing is a dish with a perfectly flat bottom made of plate glass, about one-third longer than the plate employed. The solution is as follows:

Nitrate of silver	10 parts.
Acetic acid	10 ,,
Distilled water	100 ,,

This is poured into the dish till it stands about a quarter of an inch high. The bath is then raised at one end so as to keep the solution at the other. The plate is placed in the empty part, albumenized surface upward, when by a dexterous movement of the hand the dish is brought level, and the solution allowed to pass quickly and evenly over tho plate. The plate should now be raised and lowered several times by means of a flattened silver wire, bent at one end into a right angle: in about forty seconds the plate may be removed from the bath. The same care must bo taken, as in sensitizing a collodion plate, that the solution passes evenly over tho film, for wherever there is a stoppage there will be a sharp clear line.

The plate when removed presents a nice light bluo tint. It must immediately be thoroughly washed back and front with distilled or rain water. The water should bo allowed to flow over it till no greasy streaks are perceptible. The plate is now drained, and may be used moist, or, if intended for keeping, they should be thoroughly dried, and stored away in the dark. The sensitizing solution should be filtered back into the stock bottle, and may be used over and over again, even when quite black.

The development is effected by a saturated solution of gallic acid, which has been warmed to a temperature of 80° Fahr., spread it rapidly over the plate with the aid of a soft brush, the hair being about an inch long. There is no fear of using tho brush freely, as it would almost require a knife to scratch the hardened albumen. After the solution has been on a minute or two pour off a portion, and to that remaining on the plate add some of the following:—

Nitrato of silver	2 parts.
Distilled water	100 ,,

Rest the brush on the plate, pour the nitrate solution over the brush, and rapidly mix the two solutions together. In a few seconds the picture begins to appear, if the plate has been properly exposed: if, however, it is under-exposed, the image does not appear until the solutions have been changed and the previous operation repeated several times.

Fix with hyposulphite of soda, and well wash.

The same formulæ are, we understand, used both for negatives and printing transparencies; the only difference made in the latter case being that as thin a film of albumen as possible is obtained, whilst for negatives a good body is desirable.

Mr. Sutton, in a recent number of the *Notes*, gives a statement of M. Ferrier's process as communicated by "one of the Council of the Photographic Society." We may state that the gentleman here referred to is Mr. T. R. Williams, of Regent Street, to whom the process was communicated by M. Ferrier, and by whom it was witnessed as worked by that gentleman. The name of Mr. Williams, which we have authority for using, will vouch for the technical accuracy as well as the veracity of the statement. We give below the process as stated in the *Notes*, with one or two comments suggested by the remarks of Mr. Williams thereon. It will be seen that although there are some differences in the formulæ, they are only such as might belong to the manipulations of one man at different periods. The process as stated below was used by M. Ferrier ten years ago:—

"There are probably few of our readers who have not been delighted with M. Ferrier's charming transparent slides, and who are not anxious to know how he takes his negatives, and prints from them. On the former point we are able to give accurate information, having been informed of the whole particulars of M. Ferrier's negative process by a distinguished photographer, one of the Council of the Photographic Society, who has actually worked with M. Ferrier, and witnessed the manipulation from beginning to end. The following aro the particulars with which we have been favoured, and they may be relied on for absolute accuracy, our information having been obtained from the very highest source. These particulars are now published for the first time, and have hitherto been kept a profound secret. Mr. Negretti has lately described an *imaginary** Ferrier process, which will be found in a recent number of this journal, and which is wrong in some important particulars.

"The following is M. Ferrier's negative process:—

"'A plate of glass of the stereoscopic size is first cleaned, and then stuck upon a holder having a long handle. It is first held horizantally, and iodized albumen is poured over it. It is then held in a vertical position, with the stick between tho hands, and made to revolve *slowly*, always in the same direction, so as to drive off the excess of albumen. The iodized albumen is made thus:—Ten grains of iodide of potassium are dissolved in a few drops of water, and the solution added to tho white of one egg. The whole is then beaten up, allowed to settle, and strained in the usual way.'"

There is a slight inaccuracy here we imagine. Mr. Williams called our attention to the fact that M. Ferrier did not strain or filter his solution, except so far as that operation was effected each time by the albumen flowing through the hard crusted froth on to the plate and back again into the vessel.

"The albumenized plate is next dried in a drying box, in the following way:—The box is made with grooves like a common plate box, into which the plates are put, but so far apart as to allow of tho insertion, between every pair, of a thin piece of hot baked porous wood, which absorbs the steam and dries them in a few hours. M. Ferrier uses no wonderful precautious to avoid dust upon the plate. He does not strip himself half naked, and plaster down his hair and beard with grease, as some wondermongers have affirmed. Ho simply holds between his teeth a pointed bit of wood about the size of a lucifer match, and when he holds the plato up before coating it he removes with the point of this bit of wood any particle of dust which may have fallen upon the plate. This first operation of albumenizing and drying is conducted in the bedroom of the inn where he happens to be staying."

Mr. Williams remarks that in this respect M. Ferrier, and M. Martin, with whose name photographers were much more familiar at the period referred to than at present, were strikingly opposite to each other in practice. M. Martin was as scrupulously careful to avoid dust as M. Ferrier was indifferent about it. Their respective results were, however, strikingly different. M. Martin's pictures were the finest of their day, and quite free from spots or defects, whilst those of M. Ferrier, although possessing much beauty, were frequently marred by the effects of this carelessness.

"To excite the dried albumenized plate, it is immersed in a bath of aceto-nitrate, which long use has rendered as black as ink. It is then washed in distilled water, and dried.

"The views are not taken in a binocular camera, but with only one lens, and one after the other, from stations wide apart. The right picture is taken upon the left end of tho plate, and *vice versâ*, so that there is no need to cut the negative in order that the prints may come right in the stereoscope.

"The development is effected by a saturated solution of gallic acid, with a littlo nitrate of silver added. The gallic acid is filtered into a small silver cup, and heated to about 180° over a spirit lamp. A few drops of aceto-nitrate are then added, and it is immediately poured over the plate, which has been previously wetted in a dish of water. This hot developer brings out the image very quickly, and after a time, the plate becomes stained. The developer is then poured off, and the stains cleaned away, by rubbing the film with a tuft of cotton wool. After this apparently rough treatment, which does no harm to the film, some fresh developer is heated and poured on again as before; and this is repeated until all the details are brought out, and proper intensity obtained. The picture is then fixed with hypo, and washed in the usual way. No varnish is required. The prints are taken by contact."

These details refer entirely to the negative process. Of M. Ferrier's method of producing transparencies, we have no information beyond that given by Mr. Negretti.

One of the chief points of difference between this formula and that given by Mr. Negretti consists in the amount, and the base of the iodide. In the latter, the iodide of ammonia is used, and barely five grains per ounce, whilst in the formula furnished to Mr. Williams, ten grains per ounce of iodide of potassium are used. It is, we believe, generally found amongst albumen experiments that considerable latitude may be used in regard to the amount of the iodide. It is just possible that the proportions stated by Mr. Negretti may be more suitable for the production of transparencies, whilst that given to Mr. Williams may be best for negatives.

* We think our friend, Mr. Sutton, has slightly overlooked the possible difference of time at which these processes may have been communicated by M. Ferrier, and their similarity in the main.—Ed. Photographic News.

It is generally admitted that the strength of the silver-bath and other things being equal, a large proportion of iodide gives greater sensitiveness to plates for negatives.

The same idea, in relation to the next essential point of difference, is apparent; we refer to the temperature of the developing solution. If our conjecture be correct, that the process given to Mr. Negretti had more especial reference to transparencies, and that given to Mr. Williams to negatives, be correct, the higher temperature of the developing solution would be readily accounted for; as we believe the great secret in a rapid albumen process is the use of a *very hot solution* for developing. We know this to be the practice of some of the successful manipulators in albumen, and the idea is borne out in the recently published pamphlet of M. Chevalier, in which a modification of the Taupenot process is stated to be as sensitive as wet collodion, and in it a hot solution of pyrogallic acid is used for developing. Mr. Cramb of Glasgow is stated to be in the habit of working a very rapid albumen process, an account of which was read to the Photographic Society of Scotland in the beginning of April. We are not in possession of it as yet, as it is publishing in small instalments. So far as the details are issued, we do not find any peculiarity which accounts for the rapidity of which we have heard, except the use of a bromide, as well as an iodide, an addition which is now generally used. As yet nothing about Mr. Cramb's development has been published; but we anticipate that the use of a hot developing solution will play an important part in the process. At the first blush of the thing it would naturally appear that a hot developer would only shorten the time of development and not of exposure; but a very little reflection will suggest that an energetic developer may materially shorten the exposure as well. To illustrate, we know that less exposure is required with iron development than with pyrogallic acid, simply in virtue of the former being a more energetic developer. It is probable that in all cases the action of light is instantaneous, if we had but a developer of sufficient energy to bring out the instantaneous impression.

It appears that Mr. Negretti does not regard the process given by him as suitable for a hot climate; and yet Signor Beato, whose name is well known in connection with Indian and Chinese photography, used nothing but albumen, and his landscapes are regarded by many as unsurpassed by anything yet published of Indian scenery. A formula supplied by him to one of our correspondents in India is as follows:

Albumen, whites of	20 eggs.
Iodide of potassium	154 grs.
Glacial acetic acid	40 drops.
Iodine	20 grs.

The plate, after being coated, and dried was to be excited when required in a bath of aceto-nitrate of silver, the strength of which is not stated. Before being excited the plate was to be steamed to soften the film. The plate was then thoroughly washed, dried, exposed, and developed with gallic acid. In India Signor Beato took portraits with an exposure of thirty seconds.

We are sorry to be compelled to add that mystification, and sometimes something worse, appears to be a characteristic clinging to many successful albumen operators. Signor Beato sold his formula to many amateur photographers in India: on comparing notes they were all found to be different, and few of them proved successful. The one we have given was, in the hands of our correspondent, the nearest to success, and from his account we glean that he only failed in manipulation, as he found difficulty in obtaining an even film or layer of albumen.

We shall shortly advert to the methods of other successful albumen manipulators.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

Very few fluorides are at present employed in photography; but as it is more than probable that these bodies may ultimately play a very important part in the future of our art, especially in the fixation of colour, a short account of the fluorides which are either in present use or of probable value will now follow. As the general characters of these salts are but little known we will first give a general outline of their properties. They, for the most part, resemble the chlorides, have no metallic lustre, and are easily fusible, but are not decomposed on ignition, either alone or with charcoal. The most characteristic property is their liberation of hydrofluoric acid upon mixing with oil of vitriol. The evolved hydrofluoric acid has the remarkable property of attacking and corroding glass. Some fluorides, as for instance those of tin and silver dissolve readily in water; others, such as those of potassium, sodium, and iron, are more sparingly soluble; some, as the fluorides of cadmium and strontium, are very slightly soluble, whilst a great many, as for instance those of barium, calcium, magnesium, &c., are insoluble.

Fluoride of Potassium is prepared by mixing (in a silver or platinum vessel) a solution of hydrofluoric acid with carbonate of potassa, in such quantity that the acid slightly predominates. The liquid is then to be evaporated, and the residue heated strongly to expel the excess of acid. The salt crystallizes in cubes similar to those of common salt. It fuses below a red-heat; has a sharp saline taste, and alkaline reaction, and is very deliquescent. Oil of vitriol, nitric or hydrochloric acids decompose it with evolution of corrosive vapours of hydrofluoric acid. Its solution in water even gradually causes the bottles in which it is kept to become dim. The crystals are insoluble in alcohol.

Fluoride of Sodium is formed in a similar way to the potassium salt, it crystallizes in cubes and octohedra, which are sometimes clear and sometimes opalescent, and often have a pearly lustre. The crystals decrepitate in the fire and fuse at a temperature just above the melting point of glass. Their taste is not so sharp as that of fluoride of potassium. They dissolve sparingly in water; 23 parts of water at the ordinary temperature dissolving at most only one part of fluoride of sodium, and no more even when heated. Alcohol takes up very little.

Fluoride of Calcium deserves mention, as it is the great source of all compounds of fluorine. It is found in the mineral kingdom as fluor spar, in which form it occurs in cubical crystals of various colours, white, blue, green or amethystine. Fluor spar is not easily decomposed except by sulphuric acid, which converts it into sulphate of lime with liberation of hydrofluoric acid. This property is constantly made use of in the arts for the purpose of etching and corroding glass. Some of the finest dimmed glass for focussing purposes may be made by exposing a sheet of polished glass on one side over a leaden tray, the bottom of which is covered with a mixture of coarsely powdered fluor spar and oil of vitriol to a pasty consistency. In a short time the glass will be found to be perfectly etched over its surface, and if a figure or design had been drawn upon it previously with wax (which is not attacked by hydrofluoric acid) the pattern would have been found permanently impressed upon the glass.

Fluoride of Silver.—This salt, from its properties, promises to become a very important salt to photographers, and well deserves full investigation. It is formed by dissolving oxide or carbonate of silver in an aqueous solution of hydrofluoric acid and evaporating to dryness. The salt is extremely soluble in water and deliquesces in the air. Its aqueous solution has a strongly metallic taste, blackens the skin, and is precipitated by all salts which ordinarily precipitate silver. When evaporated to dryness and heated, it fuses like the chloride of silver, and on cooling forms a greyish-black shining mass, having a lamino-radiated fracture. It is decomposed by long ignition in the air. By repeatedly evaporating and redissolving the aqueous solution of fluoride of silver, Unverdorben obtained a substance which was no longer soluble in water, but settled down in small soft laminæ: whilst moist it exhibited a golden colour, and metallic lustre; but after drying became yellow and glistening; by pressure it again acquired the colour and lustre of gold.

The solubility of this salt in water seems to point out the advisability of experiments being made with it as an addition to, or substitute for the nitrate bath. Whilst the fact of one of the products of its decomposition by light being hydrofluoric acid might be readily rendered available for a photographic process of etching on glass. Mr. R. Hunt has worked a little upon the photographic properties of fluoride of silver; but his experiments were evidently conducted under the supposition that fluoride of silver was an insoluble compound analogous to the chloride, bromide, or iodide, as in all cases he describes it as being produced by a process of double decomposition between nitrate of silver and a soluble fluoride.

The silver salt being, on the contrary, very soluble in water it is evident that no good results could be obtained by this mode of preparing it, as if it were even formed most of it would be washed out of the paper immediately. The following observations of Mr. Hunt are nevertheless, in default of more accurate knowledge on the subject, worthy of notice. He states* that paper washed over with fluoride of sodium, and then with nitrate of silver, is not more sensitive to light than the nitrate itself, but it eventually becomes darker. This is readily understood, when we consider that the easy solubility of fluoride of silver in water would cause it to dissolve in the nitrate of silver bath as soon as formed. This same compound was also submitted to prismatic analysis by Mr. Hunt. A paper was first washed with nitrate of silver, and then with fluoride of sodium. Under the spectrum the action commenced at the centre of the yellow ray, and rapidly proceeded upwards, arriving at its maximum in the blue ray. To the end of the indigo the action was very uniform; it then appeared to be very suddenly checked, and a brown tint was produced under the violet rays, all action ceasing a few lines beyond the luminous spectrum. Some faint indications of change were evident to the lowest edge of the yellow ray, but none whatever below that point. The colours of this spectrum are not a little remarkable. When the paper is slightly browned by diffused light previously to its being exposed to the action of the spectrum, the following order of colours soon becomes evident; a yellow line distinctly marks the space occupied by the yellow ray, and a green band the space of the green; through the blue and indigo region the colour is an intense blue, and over the violet a ruddy brown; these colours, says Mr. Hunt, are tolerably permanent. The same investigator has also proposed the employment of fluoride of silver in another manner in a photographic process, to which the name of *fluorotype* has been given. This process consists in the formation of a salt of silver, which Mr. Hunt supposes must be considered as the fluo-bromide of silver. A sheet of paper is to be first washed over with bromide of potassium, and then with fluoride of sodium; or the two salts may be united. The strength of the solutions should be as follows:—

Bromide of potassium	... 20 grains,
Distilled water ...	... 1 fluid ounce.
Fluoride of sodium ...	... 5 grains,
Distilled water ...	... 1 fluid ounce.

Mix a small quantity of these solutions together when the papers are to be prepared, and wash the paper once over with the mixture, and when dry apply nitrate of silver in solution, 60 grains to the ounce. These papers appear to keep for some weeks without injury, and they become impressed with good images in half a minute in the camera. This impression is not sufficiently strong to serve, in the state in which it is taken from the camera, for printing positives, but it may be rendered so by a subsequent process of development. The photograph is first soaked in water for a few minutes. It is then placed on a slab of porcelain, and a weak solution of protosulphate of iron poured over, which very readily darkens all the parts on which the light has acted to a deep brown; every object being brought out with great sharpness. When the best effect is produced the process must be stopped and the picture fixed with hyposulphite of soda.

* "Researches on Light," second edition, p. 123.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Finish.—A good photograph, perfect in gradation and detail, may be said to be highly finished; a bad one, wanting half-tone, and a proper degree of unity between the high lights, shadows, and reflected lights, is certainly unfinished.

Flexible.—In the pose of a figure, curved and bending lines, by conveying an impression of flexibility, define qualities the reverse of those which assume an appearance of immovability and stiffness. To such a pose this term would be applied.

Force.—Obtained generally by a judicious use of contrast, but frequently to be secured by the skilful disposition and arrangement of a picture's various parts. Used to describe effects in opposition to those which are defined as tame, feeble, or wanting in effect.

Foreshortening.—When you so place yourself or your lens with reference to any object as to lose the impression of its actual form, so that long objects appear short, or parts become lost to the eye, the effect is termed that of foreshortening. Care should be taken that no portion of the object or figure is so foreshortened as to produce an effect which to all but the more thoroughly educated eye, must convey an impression which would be termed distorted and unnatural. (See *Anamorphosis.*)

Genre-subjects.—Subjects of a certain *genre* or *kind*, which are of a comparatively homely or everyday character, as opposed to those which belong to historical or high art painting are so termed. Such pictures must be regarded as bounding the aspirations of the artist photographer, because the art which soars above these productions immediately enters an existence which is rather dependent upon the loftier imaginings of the mind than the simple imitations of external nature, although upon the latter it, of course, still has its only true foundation. Certain small scarce-fledged critics have derived an immense accession to their puffed-up self-esteem, by affecting to look down upon all art that is not—strictly speaking—high art. But your true connoissieur would rather contemplate a first-class *genre*-subject—hitting full in the eye of its mark—than one of those common and lamentable failures which have fallen so miserably short in an aim rashly chosen by presumption and vanity. The artist photographer may produce subjects of the first-named kind, and if really successful, win for his art the very highest appreciation; but if he think to emulate the poetical imaginings of the gifted painter in subjects which embody the highest order of composition, his fall will be in proportion to the height of his ill-considered aspirations, and the injury done to our little-understood, and much-maligned art, be really greater than if he had confined himself to the most purely mechanical and insignificant departments of his profession. There is plenty of poetry, and that of a lofty character, in those truths of nature which are within the reach of our beautiful processes. There is much to be done for the expression of feeling in our mode of arranging, selecting, developing, and printing a subject. The rules and principles which give value to the imitative production as a work of art can be as well applied to photography; but just in the degree that no mere common-place actor can thoroughly mimick the deeper or more terrible emotions of the mind by simple contortions of the visage or the limbs; just in the same proportion must an art strictly imitative fail to render such in the loftier kinds of composition. Again, the perfection of many fine models may contribute to form the painter's ideal form; but these are so cunningly blended, and harmonized so beautifully, without violation of anatomical consistency, or symmetrical proportion, that it is as impossible for any mere patchwork process of the paste-pot and scissiors to approach such perfection, as for the man who once cut penny black profiles on the London steamboats to surpass with his humble tools the productions of a Raphael or a Michael Angelo.* As I said in a previous article, there is a vast and hardly opened field awaiting the ambitious artist photographer—a field which Wilkie and Teniers did not contemn, and many as eminent in their art have been proud to adorn; but we must not make ourselves artificial wings wherewith to reach the native home of birds which sing at "heaven's gate," or great will be our fall, and loud the laughter of our enemies. Robinson's "Holiday in the Woods"—although faulty—is a most successful and very admirable application of photography to a *genre*-subject, but his Ophelia of the previous year being dependent for its effect chiefly upon the expression given by the model, was a great failure. Rejlander has been *wonderfully* successful in the expressions secured for the faces and positions of his models; but even his most ambitious effort, "The Two Ways of Life," although singularly effective in all other respects, fell, in the amount of the success it achieved, far short of his less ambitious efforts. I therefore advise you as an artist photogropher not to listen to those critics who, to convey lofty ideas of their own reverentially high pitch of refinement and taste, affect in the smart or grandiloquent paragraphs of their critiques to look down upon *genre*-subjects, any more than I advise you to listen to such as endeavour to persuade us that photography has no other bounds in art than such as shut in the greatest genius of the most inspired and educated of poet-painters. If we can't write Milton's immortal epics, there are plenty of sweet little poems whose music is full of exquisite pleasure and loving lessons for the world, which *are* within the reach of our powers, and have not been scorned even by the mightiest of the giant intelects of historical painting.

Glazing.—In Rejlander's very capital and instructive paper upon his photographic picture, "Two Ways of Life," (which, by-the-bye, I do *so* wish the editor would print in these pages†), he tells us, "If there be too much of crude light I will glaze over some parts with the sunbeam;" and describing this method of glazing says, "I cover up some parts of the picture, and use a few *rays* and *pencils* of light to just glaze ‡ over the gamboling group; and, using them a little more freely on the hinder figures, I said 'thank you,' and covered them up—'now please to paint me the back-ground behind them.' The rays do my bidding, and on it goes, smoothly and evenly; I can almost see the fluid flow, and, knowing from practice how it will be reduced in the hypo-bath, I let the light paint it deeper in appearance than it was intended to be. I then uncover the idle group, and bid the light sink one of those figures deeper in the shade. I then solicit the rays to do the same on the side of industry, and many of the spots and marks from the printing of the separate figures are then evened by the same *brush*, and finally the whole top of the picture is exposed; but as such light as I choose works quickly, I must move as fast and guide it well, or there will be marks from his brush." Thus does the sun-light in an artist photographer's hands prove as effective for the purpose of glazing as the hair-brush and transparent pigment of the painter. To use the words of Rejlander once more, "*photography is like a brush full of paint*, USE IT AS YOU ARE ABLE."

* What has become of this once numerous race? I think I recognized one touting at a fourpenny portrait establishment. Has photography swallowed them all up in its capacious maw?

† I do not know a paper which contains more interesting or instructive matter, or one which more clearly proves photography's claim as a fine art. From the time I read it first I felt the warmest respect for and admiration of its author's manly courage, dauntless perseverance, and high artistic talents. Were his paper yet to be read and published I think the photographic world would be much better fitted to appreciate, understand, and apply it than it was at the time it appeared in the Society's *Journal*.

‡ The colours used for glazing are always of a darker tint than the solid colour beneath it; thus, it is said of Apelles, that he glazed with a dark transparent varnish. The processes of glazing are in photography and painting, therefore, essentially the same.

Gradation.—A term not only applied to the tones of the lights and shadows of a picture, when arranged in their natural order, but used also to define the proper subordination of inferior parts in their relationship with the principal. Hence *subordination* is a word sometimes used to express the same meaning. Gradation serves to prevent violent contrasts of tones by intervening or harmonizing extremes. A photograph lacking gradation becomes either spotty and hard, or flat and monotonous in effect. Proper degrees of atmospherical gradation (see *Ærial Perspective*) secures the effect of space, landscape's most charming quality. By gradation of effect is understood the growing impression which leads to or from the picture's chief aim or intention, by other subordinated effects leading gradually up to, or down from, the same. Nature *truthfully* represented must always give gradation,

FAIR PLAY FOR PHOTOGRAPHY.

(*From Punch.*)

SEEING what they weekly have before them in our pages, it is needless to remind our innumerable readers that Art in any shape or form is ever under the protection and the patronage of *Punch.* From the pictures "on the line" at the Royal Academy Exhibition, to the crayon caricatures which are covertly designed on *Mr. Punch's* doorsteps, and wherewith small artists decorate his newly-painted shutters, all works of Art are cherished and encouraged by his influence, and the interests of artists are watched over and secured.

Now *Mr. Punch* has learned from certain of his photographic friends, including his friend, FREDERICK, Lord Chief Baron of England, that HER MAJESTY'S Commissioners for next year's Great Exhibition have thought fit to pass an insult upon Photographic Art, by classing its productions with railway plant and garden-tools, small arms and ships' tackle, big guns and new omnibuses, donkey-carts and corn-extractors, and the thousand other articles of mechanical apparatus comprised in Section II. The Lord Chief Baron, as the mouthpiece of the Photographic Council, has pointed out to the Commissioners that—

"In the observations of natural scenery and in the selection of what shall be represented with reference to the effect of light and shade, and from what point of view, in the grouping and arranging of the principal or accessory objects for the purpose of forming a picture, photography is no doubt an art, an imitative art; but the Council of the Photographic Society claim for it a position, however humble, among the fine arts, if etching and engraving may be so placed, as no doubt justly they may."

In other word, that is, they claim for Photographs a place among the articles admitted under Section IV., which, under the expansive head of "Modern Fine Arts," includes architecture, models, die-sinking, and engravings, in fact (except photographs) anything and everything in any way artistic, from the cast for a new halfpenny and the designs for Guards' Memorials, up to paintings by a MILLAIS and drawings by a PUNCH!

In summing up the case against HER MAJESTY'S Commissioners, the Lord Chief Baron states the grievance of the Photographic plaintiffs in language which, if forcible, is clearly not unfair:—

"The Photographic Society has been founded chiefly with a view to promote photography in connection with science and the fine arts, and the members interest themselves about photographic apparatus in the same manner only as a RAPHAEL or a REYNOLDS might select and use the most convenient easel, the best brushes, or the most appropriate and enduring colours. The instrument is comparatively nothing. * * * They do not complain that the apparatus they use is put among all the other apparatus; but they do complain that results such as have been exhibited for many years by the Society, and have been honoured by the presence and encouragement of HER MAJESTY and H R.H. THE PRINCE CONSORT, are deemed worthy of no better place than among tools and mechanical devices of whatever merit; and they would appeal to the Royal and illustrious patrons of their body to be rescued from the comparative degradation of being mixed up with the last improvement in ploughs or cart-wheels or ships' tackle."

This appeal, *Mr. Punch*, in his Royal pleasure, is pleased graciously to back; and when His wishes are made known to the Commissioners, there will be little need of other "Royal Patrons" to bestir themselves, as His remonstrance will, of course, suffice to set the matter right.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE fifth annual meeting was held in the Society's Hall, 51, George Street, on Tuesday, May 14th, SHERIFF MOIR, Vice-President, in the chair.

The usual routine proceedings having taken place, and Captain James Grant Suttie having been elected a member of the Society—The Honorary Secretary read the following

REPORT OF THE COUNCIL.

In presenting their Report on the conclusion of the Fifth Year of the Society's existence, the Council would have been glad if they had been enabled to congratulate the members on the past year having been one of more marked progress. Believing, however, that it rests very much with the members themselves, to add not only to the interest of the meetings, but to the usefulness of the society generally, the Council do not doubt but the prominent place, which the society has hitherto occupied, will be fully maintained; and while they trust that before next season they may be able to make such arrangements as will add to the attractiveness of the monthly meetings, they would desire strongly to urge upon members, individually, the many advantages which would arise if they would communicate freely the results of their investigations and experience in particular departments of the Art. Great discoveries are possibly not now to be expected, but still there is an ample field for improvement in all the various branches of the Art,—Chemical, Optical, and Manipulatory; and nothing would form a more attractive feature in the meetings of the society, than the unreserved communication of such details, as well as the exhibition of any new apparatus of which the members of the society may be in possession. While regretting, however, that more has not been done, the Council may fairly congratulate the society on having been the means of giving to the photographic world so many interesting papers as were read before them last year, and published in the *Photographic Journal;* and they desire to record the obligations under which they lie to Sir D. Brewster, Mr. Claudet, Mr. Wall, Mr. L'Amy, Mr. Tunny, Mr. Walker, Mr. Taylor, Mr. Maxwell Lyte, Mr. Cramb, Mr. Burnett, and others, for having contributed them.

At the last Annual General Meeting, the Council had the pleasure of recommending that the Society's Bronze Medal should be awarded to Mr. Macnair, for the account which he had laid before the society of his new dry collodion process. The Council are glad to observe that further experience of this valuable process has completely justified their recommendation. All who have practised it are convinced that it is much the best dry process yet discovered. Its great advantages are the simplicity and certainty of the preparation, the sensitiveness in the camera, and rapidity of development (approaching in these respects even to wet collodion,) the great length of time which it enables the plates to be kept without the slightest deterioration, and the vigour and delicacy of the resulting pictures. Whilst so many new dry processes, or rather modifications of existing processes, are being brought before the public, many of which, by their complication and uncertainty, prove unsatisfactory when tested by the practical photographer, it must be highly satisfactory to the Society to have been the means, through one of its members, of introducing a process which is really valuable and practical.

As the society is aware, the opening of the last Exhibition was postponed from December to February; this was done under the impression that a larger number of visitors might be expected at a season when there are more strangers in town, and the weather is more favourable for visiting places of the kind; the result, however, has not been such as was anticipated, and the Council therefore propose that the next Exhibition should be opened in December, as formerly. The Council are glad to say that, notwithstanding the diminished attendance, the Exhibition will still leave a small balance at the credit of the society; and they need scarcely remind members that in all other respects it was completely successful;—a similar collection in point of merit, more particularly in landscape photography, having probably not previously been brought together.

The two silver medals of the society were this year awarded to Messrs. Claudet and Maxwell Lyte; and on the suggestion of Mr. Horatio Ross, who had again kindly acted as judge, an additional bronze medal was awarded to Mr. H. P. Robinson. It would doubtless be gratifying to the society to see how much the award of their medal is appreciated;—Mr. Claudet having come from London specially to receive his, and both the other gentlemen having expressed in very flattering terms their sense of the honour conferred on them.

Notwithstanding the comparatively unfavourable result of the Exhibition, the funds of the society are in a highly satisfactory position, as will be seen by the annexed state.

It will be in the recollection of the society that it was thought desirable to accumulate, from the annual income, a fund, to be applied in procuring rooms for the special use of the society. From the experience gained elsewhere, however, the Council fear that the great expense attendant on such a scheme, both in reference to original outlay and annual expenditure, places it beyond the reach of the society: accordingly, they would now propose that the society should limit its exertions in this direction, and rather look to entering into an arrangement for acquiring convenient premises along with other kindred societies. As the Council are of opinion that the fund already accumulated should prove sufficient for this purpose, they would suggest that, in future years, a portion of the annual income should be applied in furnishing to each member a photograph, or photographs, illustrative of the progress of the Art; and they would hope that in this way the non-resident members of the society will be enabled to share somewhat more largely than they do at present in its advantages.

As required by the laws of the Society, the President, the Senior Vice-President, (Mr. Horatio Ross), the four Senior Members of the Council, (Messrs. A. Y. Herries, George Harvey, T. Milville Raven, and T. B. Johnston), the Honorary Secretary, and the Honorary Treasurer, retire upon this occasion, but are re-eligible.

The Council would suggest that the President, Vice-President, Secretary, and Treasurer, should be re-elected to their respective offices; that Mr. Herries and Mr. Johnston should be re-elected Councillors; and that Major Ramsay L'Amy, and Mr. Findlay Anderson should be elected in place of Mr. Harvey, who has expressed a desire to retire, and Mr. Raven, who now resides in England.

A state of the funds for the past year is annexed, showing the sum of £386 18s. 11d. in favour of the Society, as compared with £315 12s. 8d. at the close of the preceding year.

On the motion of Sheriff Hallard, seconded by Wm. Walker, Esq., the Report was unanimously adopted.

STATE OF THE FUNDS AT MAY 1, 1861.

	£	s.	d.
Balance in favour of the Society on the General Account, at 1st May, 1861	£380	9	3
Balance on Accounts in connexion with Exhibition and Sale of Photographs	4	7	8
Arrears of Subscriptions due by Members considered recoverable	2	2	0
Amount of Funds as at 1st May 1861	£386	18	11

The following are the officers for 1861-2:—

Patron.—His Royal Highness the Prince Consort.

President.—Sir David Brewster.

Vice-Presidents.—Horatio Ross, George Moir.

Council.—Wm. Scott Elliot, Wm. Walker, C. G. H. Kinnear, John Moffat, Alex. Young Herries, T. B. Johnston, J. Ramsay L'Amy, Findlay Anderson.

Honorary Treasurer.—H. G. Watson.

Honorary Secretary.—A. F. Adam.

Honorary Auditor.—John Cay.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The monthly meeting was held at Myddelton Hall on the evening of Wednesday, the 29th ult. Mr. G. Shadbolt in the chair.

After the minutes of the previous meeting had been read and confirmed, Messrs. G. Elphick and T. Hearn were elected members of the society.

Mr. J. Barnett, honorary secretary to the society, then exhibited a vertical camera of his own contrivance and manufacture, which was intended for copying. He read a brief description paper, as follows:—The idea of making a vertical camera was first suggested to me about twelve months ago, on seeing Mr. W. Hislop attach a portrait camera to the ordinary stand for the purpose of copying geological specimens. The object I then had in view was to produce slides for the magic lantern which should be worthy of our times; and as many of the subjects I desired to possess were prints bound up in different books, I was quite at a loss as to the best means of copying them. Many were too large, others too small, and it was essential to have uniformity in size. A book could not be conveniently fastened against a wall or screen; and, if it could, the grain of the paper was so strongly marked by the side light upon it that it became visible in the negative, and, of course, was reproduced in the printing. The same objection as to fixture applied to plaster medallions, coins, crystals, &c. &c.

I therefore made the camera before you: it is simple, easy of adjustment, perfectly rigid; and, when a print is once correctly focussed, any number of other prints of the same dimensions may be copied, without alteration of camera arrangement, or the slightest chance of the negatives being out of focus. It admits of extension to *twenty-two* inches, and will slide into the body so as to bring the lens within *eleven* inches of the glass screen, so that the object to be copied (if a lens of five-and-a-half inches focal length be used) can be increased to three diameters, or reduced to two-thirds of its original size; and should it be necessary to reduce a large object, it can be placed below the stand, which is left open at the bottom, or it may be used in the ordinary horizontal manner, in which form it is useful in copying glass positives, and other transparent pictures.

The arrangement consists of two perpendicular uprights, fitted in a frame at right angles. Attached to the back of the camera is a slip of oak that runs in a V groove in the uprights, and to fix it in any desired part a screw-bolt and nut is provided, which clenches it so firmly that no ordinary pressure will remove it. The inner, or sliding-box of the camera is similar to that in general use, with the exception of being lengthened by a tube, with the lens attached, or rather sliding in a V groove at its base, so as to admit other lenses, or a combination, according to the work to be done.

The manner of focussing is thus performed:—if the object is to be enlarged, draw out the tube to some extent, and fix with one of the side screws, of which there are six—three on each side; then draw up or lower the camera on the uprights until the focus is clear: if not large enough, draw the tube out further, fixing as before, and so proceed until the exact size and desired sharpness is obtained, then fix in position by the screw-bolt at the top. If it should be necessary the fine adjustment of the lens can now be used. To reduce an object I find it best to slide the tube up to its full extent, and draw out if necessary.

You will perceive there is but one slide, and that the dark one: it carries the ground-glass, which is removed for the prepared plate to take its place. One great advantage in this is the certainty of obtaining a picture in the exact focus it appeared on the screen; and, however carelessly the apparatus may have been made, you will not experience the annoyance so often felt at finding your picture less sharp when taken than it appeared on the ground-glass.

I am desirous it should be distinctly understood that I make no claim to originality in the formation of this camera. I have only done a little towards maturing the method adopted by Mr. Hislop; and should any friends feel disposed to follow out the *principle* here adopted for copying purposes, they will find an immense saving of time, and I doubt not we shall have some pleasing results placed upon the table at our next meeting.

Mr. MOENS asked if the camera being above the object to be copied did not prevent the light falling properly on it.

Mr. BARNARD had not found in practice that it did so at all.

Mr. BARBER asked what was the especial advantage in the vertical shape.

Mr. BARNARD said, that the light striking the paper vertically instead of from the side, the grain or texture of the surface was much less apparent.

Mr. BARBER thought that a similar effect might be obtained by placing the camera in such a position that direct light from the window did not strike the picture to be copied, but only diffused light of the room.

Mr. BARNARD said there were other advantages; the engravings he wished to copy were chiefly in books, and this camera offered facilities for copying them without removal from the books.

A conversation then arose on the subject of the best wood for cameras, &c., the Chairman observing that he was glad to see that Mr. Barnard had used deal for his camera. He had not, however, selected the best kind for that purpose; it should have Christiana white deal, instead of Quebec white pine, which, although light, would not stand so well.

Mr. SHADBOLT then vacated the chair and read some remarks on the mounting of stereographs, of which the following is an abstract. He said that corresponding points in a pair of stereographs, viewed through a whole-lens stereoscope, should be placed at such distance apart as equals that between the eyes of the observer; but, if viewed through a prismatic stereoscope, the separation of the corresponding pictorial points should be augmented by the amount of lateral displacement. Now, there being two variable quantities involved—viz., the width between the eyes of different observers and the lateral displacement of rays by the prisms used—it was necessary to ascertain something like an approach to an average of the amount of these inconstant quantities, and, after careful consideration of the matter, he had fixed it at 2·75 inches. He had measured the distance in a large collection of Wilson's gems, remembering that when they are viewed in one of Smith, Beck, and Beck's achromatic stereoscopes, they produced an effect suggestive of natural size and distant view. The distance between similar points was very constant, being 2·8 inches, differing only *five-hundredths* of an inch from the standard which he had adopted.

As the field of view in a stereograph was necessarily more contracted than in nature, the illusive effect produced was improved by so mounting the pair that we might appear to be regarding the view *through an aperture* not very distant, which limits the amount of subject seen. In such a case actually occurring, the right eye could see rather more of the left side of the view, and rather less of the right side than could be observed with the left eye, and *vice versâ*. To give an illustration:—Suppose a person standing near a small window, looking into a garden, and perceiving in the centre a fountain, and an avenue of trees, at regular intervals, stretching away from the fountain on either hand. Now, if he closed the left eye, keeping the head still, he would find that the vista included three trees on the right side of the fountain, and four on its left side. Now, on opening the left, and closing the right eye, still keeping the head in the same position, he would find that the left side of the fountain had but three trees visible between it and the window frame, while there are four in the space on the right side.

It was therefore clear that—although the right and left pictures each included the same amount of subject—though eight trees were visible to the observer only seven of them were seen by either eye. Therefore, if in mounting stereographs they bear this fact in mind, and cut the pictures in accordance with this principle, the illusory effect was materially improved; because then the mounting card (which should be of an unobtrusive hue, such as black, grey, or drab) acted like a diaphragm, appearing near at hand, while the landscape in the photograph seems to recede from the spectator.

Assuming that $2\frac{3}{4}$ inches was the intended distance between corresponding points of the pair of pictures when mounted, let

a | R *b* | L | *c*

represent a negative taken by a bi-lens camera on R and L, the corresponding points. They must cut the proof so that the distance *a* R, added to L *c*, would together make exactly $2\frac{3}{4}$ inches; but it was also needful, at the same time, to arrange so that the distance *a* R was greater than *b* L, and that *a b* and *b c* was equal. The amount of variation was of minor importance; but if too great, say exceeding a quarter of an inch, the effect would not be pleasing. The above precautions also involved the fact that R *b* is less than L *c*. In conclusion we observed that it was not needful that the sum of *a* R and L *c* should amount to $2\frac{3}{4}$ inches, provided that it did not exceed it, *and* that when transposed, a space be left between the margins *a* and *c* (which would then be contiguous), so that the points L and R are exactly $2\frac{3}{4}$ inches apart.

Mr. DAWSON referred to the method adopted by Mr. Russell Sedgfield, which was explained more at length by

Mr. HUGHES, who stated that Mr. Sedgfield's object was to secure uniformity and good results with as little trouble as possible; he therefore so arranged his negatives as to aid this end. If the negatives were taken with a bi-lens camera, they were cut in two, and bound together in the required position on to another plate of glass, so that the pictures when printed required no cutting. A mark or marks were made on the negative through which pins were run in the prints, which were thus arranged so as to cut three dozen at a time, both halves of the picture at once, which was not divided in the middle. They were cut by means of a steel shape and a press something like that used for stamping the impressions of dies on envelopes; the pressure being obtained by means of a screw and lever which was sent spinning round by one rapid turn of the hand.

The Chairman called attention to some exquisite groups of flowers photographed and presented to the society by Mr. Mainwaring.

Mr. Barber showed some negatives by the resin process. He had at first tried it with his ordinary nitrate bath, which probably contained a little nitric acid, and got nothing but fog and stains; but had since tried it with a fresh bath, to which he had added about two or three minims of acetic acid per ounce, and the result was good clean negatives. He had not, however, noticed that the plates possessed especial sensitiveness.

A conversation on the subject followed, in which several members took part, the Chairman observing that the re-dipping in the nitrate bath, which Mr. Barber had omitted, was insisted on by the advocates of the resin process, as a point vital to rapidity, or shortness of exposure.

Mr. Hughes alluded to the simple dry process to which Mr. Hannaford had recently been calling attention, and regarding which he had heard many good accounts; he referred to the addition of silver to the albumen solution. He knew a gentleman who had long successfully practised the Taupenot process, who was thinking of giving it up for the new method.

Mr. Barber suggested that the preparation of an ammonia-nitrate solution, and adding it to the albumen, would be a more simple and philosophical method of proceeding about the matter, than the addition of nitrate of silver to a solution of albumen containing ammonia.

After some further conversation on the subject, in which the Chairman observed that he had received communications from several correspondents, speaking highly of the process, the subject dropped.

Mr. Shave asked if any one knew anything of the new process which was to abrogate the necessity for a silver bath.

Mr. G. Wharton Simpson said he had himself produced negatives by the process, but they were not all that could be desired, having a tendency to be thin in the lights and veiled in the shadows. He was not aware whether Captain Dixon, the inventor, had made any more progress with it; but he believed the matter remained, at present, in a state of *statu quo*.

The Chairman then stated that the committee had resolved to recommend that the monthly meetings should in future be held on the last Wednesday but one, instead of the last Wednesday in the month, which suggestion was accepted and agreed to by the meeting.

The proceedings then terminated.

London Photographic Society.

The monthly meeting of the society was held at King's College on Tuesday evening, Joseph Durham, Esq., in the chair.

The meeting was held on this occasion in the theatre of the college to afford a better opportunity of exhibiting Professor Way's electric light, as announced by Mr. Vernon Heath at the last meeting.

After the minutes of the previous meeting had been read the following gentlemen were elected members of the society:—Earl Cawdor, R. C. Oldfield, Esq., and Major Shakspeare.

Mr. Vernon Heath, in pursuance of a notice at the last meeting, made some remarks on the anomalous position in which it has been proposed to place photography at the forthcoming International Exhibition. His task, he observed, was very much simplified by the forcible and appropriate letter of their excellent president. He might now content himself, therefore, by asking the chairman to detail to them what had occurred since. At all events, whatever answer that letter might receive, he felt sure that the spirit of the president's letter, and the manner in which the council had taken the matter up, were both such as to deserve their warmest and best thanks. He would not now detain them by entering further into the matter, as the Chief Baron's letter quite exhausted the subject. He would just ask the chairman, therefore, to state to them the present position in which the matter stood.

The Chairman said the best thing would be simply to call upon the secretary to read the minutes of the various meetings on this subject held by the council, and the correspondence which had passed between the council and the commissioners. By this means the meeting would be put in possession of the results as they at present stood

The Secretary then read the minutes of the meetings of the council, referring to the subject, and the correspondence into which they had entered regarding it. The results up to last week our readers are already familiar with. Since then the commissioners have answered the Chief Baron's second letter to which we have referred, and decline to receive the proposed deputation from the society. The council had again met that day and come to certain conclusions which they did not deem it prudent at the present stage of affairs to communicate. A letter which they had received from Dr. Lyon Playfair was also read, in which he strongly condemned the proposed classification, and maintained the right of photography to be classified amongst the fine arts, observing that engraving might, with equal propriety, be placed as a sub-division under cutlery, because it was produced by edge tools, as photography classed with the apparatus necessary to its manipulations.

Mr. H. G. Bohn said he was chairman of one of the sub-committees of the Exhibition of 1851. If he remembered rightly he shared a department with Mr. Owen Jones, and photographers were then admitted as belonging to the fine arts; being placed, if he mistook not, in the same category as colour printing.

Mr. Malone called Mr. Bohn's attention to his remarks on this subject at the last meeting, in which he stated that photographs were denied the claim to be placed amongst the fine arts.

A conversation on the subject arose in which Mr. Bohn remarked that he had only referred to what came under his notice in his own department in the gallery. Mr. Malone might be quite correct as to what took place in other departments. It further transpired from the chairman that it was not improbable that a special meeting of the members might be called to determine what steps should finally be taken in this matter.

Mr. Shadbolt referred to the cool assumption contained in one of the letters of the Commissioners, that a committee would be appointed to co-operate with them, when the Chief Baron had distinctly stated that no such committee would be appointed unless Photography was placed in its legitimate position.

The Secretary called attention to some specimens by Mr. Bedford taken for the purpose of testing one of Ross's orthographic lenses.

Mr. Bedford stated, that the lens had been especially tested in reference to an alleged want of what was termed depth of focus. He had tested the lens very severely, inasmuch as he had taken the negatives upon a 12in. by 10in. plate with a lens only intended to cover 8½in. by 6½in., or ordinary whole plate. The interior, one of Ely Cathedral, was exposed five minutes with the full aperture, and taken on a wet collodion plate. The exterior of the same building was exposed eight seconds with a stop of $\frac{1}{75}$ of an inch. The results were, he thought, under the circumstances, very satisfactory.

Mr. Shadbolt had in his hands some prints from negatives taken by the gentleman who had stated this lens was incompetent to do its work; two of the pictures were by this lens, and called defective; and other two exhibited as pendants to them, and called analogous for testing purposes. Now the subjects were so dissimilar, and unfair as tests of the relative qualities of any lens, that he unhesitatingly said the man who called them analogous was incompetent to test any lens. Regarding this quality of so-called depth of focus, a lens possessing it was as bad a lens as could be. The phrase itself was an absurdity, and was only used by opticians who did not know their work, or who wished to deceive the public. It was impossible to have objects in different planes all equally sharp; and what was termed depth of focus, was simply destroying all focus, and making the definition of every part equally bad.

Mr. Sutton said there were *two* kinds of depth of focus: that produced by a bad lens with large aperture, and that produced by a good lens with a small aperture. They were two essentially different things: the one a desirable quality, and the other undesirable. Mr. Shadbolt seemed to confound these two things together.

Mr. Shadbolt said there was no such thing at all: it was altogether a myth. The only effect of using a small aperture was, that objects out of the focal plane were not quite so much out of focus. The light entering at a more acute angle when the small stop was used, a section of this acute angle did not cause such a large blot or blur as it would if it were a more obtuse angle. In other words, the circle of least confusion was more easily ascertained when a small aperture was used.

Mr. Malone said with regard to a single lens with a full aperture there was, absolutely speaking, no depth of focus at all; and so far, theoretically speaking, Mr. Shadbolt was right. But he also agreed with Mr. Sutton that we must look at the question practically, and in relation to the necessities of photography. A lens might give what was termed depth of focus, and that depth might arise from its being in a certain sense a bad lens; but nevertheless its results might be admired. He knew a portrait lens of such a character, and it gave very good and pleasant portraits; but he believed, notwithstanding that, it would be regarded from Mr. Ross's point of view as being very faulty. There was no absolute or mathematical focus anywhere. It was an important point to select a lens in relation to its purpose. If it were always necessary to stop down a lens very much in order to secure the required depth, it was often at an inconvenient sacrifice of light.

Mr. Shadbolt thought Mr. Malone had availed himself of the French philospher's maxim, and used language to conceal his ideas.

Mr. Sutton said, if there were no such thing as depth of focus, it would be impossible to get a photograph fit to be seen. He should like to know what Mr. Shadbolt called that quality which rendered the retiring objects in a picture at all tolerable.

Mr. Shadbolt simply denied that it was possible to get two objects in different planes at the same time. It was impossible to get one in, without the other being more or less out.

Mr. Sutton said it was quite possible to give sufficient definition to all objects within a space of from twenty-five yards to a mile or two.

Mr. Shadbolt: Simply because in that case there was no object in focus.

Mr. Sutton: Oh yes—as fine as possible.

The Chairman thought there was far too great a tendency on the part of photographers to tie lenses down to do one thing, and if it exceeded that it was proclaimed to be bad photography. It might be so; but it was good art. He had seen such landscapes and such portraits, which some would say were not perfect photography. But they were such views of nature as some of the greatest masters in art, such men as Raphael, Claude, and Teniers, had seen, and pourtrayed, and considered right; and if it were bad photography it was beautiful art. He was sorry to be compelled to say it; but artists loved those things which many photographers called bad. Such photographs were very rare, but were prized by artists as treasures when they could be obtained.

Mr. Shadbolt denied in toto the Chairman's remarks as referring to photographers and artists. He had stated that no lens could produce two different planes in absolute focus at the same time, and in saying so he had merely affirmed of a lens what was true of the human eye, and he contended that it was true art to produce a picture similar to that formed on the retina of the eye.

Mr. Malone said he had been charged with want of clearness by Mr. Shadbolt—he just wished one or two words more to make himself clearer. He remembered some years ago a large lens of five inches in diameter, made by the late Mr. Ross, which he had to test. On trying it out of the window at the opposite side of the street, they found they could not get the bricks of the opposite house and the railings which sursurrounded it into anything like focus at the same time, and when they complained of this to Mr. Ross, he said he thought they were very unreasonable to want such a thing. When, however, they took a small lens of six inches focus and tried it, that gave the result meant by depth of focus; both the railings and the bricks were sufficiently defined without sacrificing either. He believed a more perfect picture of the subject would have been obtained by taking it with the small lens first and then enlarging, than by taking with the large lens direct.

Mr. Vernon Heath then proceeded to read a paper descriptive of the Professor Way's electric light and its applicability to photographic purposes.

This light, which is considered to possess more of the photogenic rays than any other artificial light, has been more than once described in our columns. Its exhibition excited considerable interest, which was enhanced by the exhibition, for the purpose of comparison of Duboscq's electric lamp. The latter possesses simply the illuminating qualities of a very brilliant artificial light, whilst the mercurial light of Professor Way, from the striking absence of any of the red rays, is very peculiar in its illuminating effect. Every countenance appears of a most ghastly hue, which, together with the purple lips, suggests that the spectator has suddenly visited a lazar house, or plague-stricken community, whilst everything else, almost, appears other than it was a few minutes before.

Printing in the printing frame and by means of the solar camera were conducted before the meeting. The details and discussion thereon we must, for lack of space, reserve for another week.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 5th June, 1861.

Positive printing on albumenized paper appears to command increased attention just now, and justly so, for while nearly every other element of photographic success has arrived at a state, if not exactly of perfection, at least at a very satisfactory approach to it. But what avails all this, if positive printing remains in a state of uncertainty? if the fruit of all our previous care and labour must ultimately disappear and perish? Mr. Maxwell Lyte has recently given us the benefit of his experience, and proposed formula, which it is to be hoped will secure to the photographer such results as may defy the inroads of time. Now, the Abbé Pujo has undertaken an investigation of the phenomena of positive printing, more especially with regard to the nature of the compound of albumen and nitrate of silver, commonly described as albuminate of silver, which appears to play a very important part in positive printing, the details of his investigation are very interesting; but as they are too lengthy to be comprised within the limits of a letter I must send you a separate communication, which I doubt not will deeply interest such of your readers as take an interest in the philosophy of positive printing.

M. Becquerel's researches upon electro-chemical colouration, and the deposit of peroxide of iron upon plates of iron and steel, are not without interest to photographers. His aim was not to produce coloured rings like those of Nabile (1827), but to deposit on plates of gold, platinum, silver, copper, and other metals, thin and uniform coatings of peroxide of lead, presenting in succession, according to the duration of the operation, which is generally very short, the rich colours of the spectrum. Into an alkaline solution of protoxide of lead he immerses the pieces of metal to be coloured, putting it in connection with the positive pole of a nitric acid pile composed of several couples; he then closes the circuit with a platinum wire in communication with the negative pole, the point of which alone touches the alkaline solution, and is kept constantly in motion. The protoxide of lead in contact with the object to be coloured, which forms the positive electrode, is superoxydised, becomes insoluble in the alkali, and deposits itself upon the surface in thin films with the production of colours, which are adherent. These colours become gradually weaker by contact with air and light, unless covered with spirit varnish, which acts only very feebly on the peroxide. With a little practice we can soon succeed in giving every desirable tint to an object of large dimensions of irregular surface, which, it may be said, can be painted in appropriate colours. In what manner these colours may be rendered permanent will be explained hereafter.

By substituting a solution or protoxide of iron in ammonia for the solution of protoxide of lead in potassa and a plate of polished iron in lieu of the plate of gold, platinum, copper, or silver it deposits upon the latter a film of peroxide of iron with brown red tints which deepen more and more as the film becomes thicker.

In precipitating metals from their solutions by other more oxidizable metals, M. Becquerel remarks that upon immersing a plate of copper in a solution of double chloride of potassium and platinum, heated to 100° Fahr., we perceive it to become covered with a film of adherent platinum, thin, and brightly coloured, but which gradually alters and becomes brown in the atmosphere. This change is partly due to the presence of protochloride of copper which is deposited with the platinum towards the end of the operation. On washing the platinized copper with water acidulated by acetic acid, or in rubbing its surface with cotton and colcothar, the protochloride is removed, and the change ceases, or at least manifests itself only after a very long time.

If platinized copper is employed, at the moment it is removed from the solution of double chloride. as the positive electrode to decompose water with a pile composed of a few elements, it produces, under the influence of the oxygen disengaged from the positive pole, some effects of colouring characterized by a deep crimson blue tint, which does not yield the protochloride of copper altered by light, and which is unchangeable in the air.

If for decomposing water we employ, as a positive electrode, a plate of copper covered with a film of peroxide of lead yielding one of the pure colours of the spectrum, we find that at the end of a few moments, the colour is preserved. In allowing the electro-chemical action for a quarter of an hour, or half an hour, according to the strength of the pile, the violet and blue tints become weaker, and change to green and yellow. When upon a plate of gold or platinum, we deposit electrochemically, by means of a solution of double chloride of potassium and platinum containing no copper, a very thin film of platinum, this film undergoes no change either in the atmosphere, or when the plate is employed as a positive electrode to decompose water; it is not so when the solution contains copper; we then see it produce the colouring effects previously described; when the proportion of copper is very feeble, diluted nitric acid does not destroy the colour on the platinum, which is a very great advantage in application.

The solution of double chloride of potassium and platinum in hyposulphite of soda, gives magnificent effects of colouring.

The deposits of peroxide of iron upon iron and steel, which, almost unchangeable in the atmosphere, become so when the plates have been employed as positive electrodes to decompose water.

M. Becquerel has presented some specimens of this new art to the Paris Academy of Sciences, where they excited much admiration.

ART PHOTOGRAPHIC SOCIETY.

Dear Sir,—The discussions now in progress between the advocates of photography as an art, and Her Majesty's Commissioners for the next Great Exhibition of 1862, induce me to trouble you with a few lines on the subject.

It must be remembered that until quite recently this country has not been at all distinguished for the slightest display of interest in the development and cultivation of artistic taste or knowledge. While universities were giving full and free opportunities for the study of the principles, practice, and theoretical elements of art in all the more highly educated countries of the world, England appeared rather to regard such branches of tuition as a fanciful luxury, fitted only for the leisure and refinement of aristocratic wealth and taste; for, from the humblest school, upwards to our colleges and universities, the culture and study of art was, even in its simplest elements, thoroughly neglected.

What wonder then, when a picture-producing agent was placed within the creative power of all who would patiently master its first mechanical difficulties, productions which, for truth of outline and perfection of detail, surpassed the best works of the greatest painters, that this new art should so soon be buried, as it were, beneath a mountain of productions displaying the most perfect ignorance of artistic rules, principles, and theories?

That this was true of photography, all artistic observers must confess, and that this does not seem likely to continue true, is due to the efforts of the few who, like yourself, labour to create a just feeling and regard for art among the practitioners of photography, rather than to those older established journals and societies who have so culpably neglected this essential element of the new arts' upward progress. That such journals and such societies are losing ground, or becoming extinct, must be attributed to their misconception of the characteristics and scope of the art they are supposed to advance.

That photography does not rank as an art in public estimation, and that Her Majesty's Commissioners class its productions with its apparatus and processes as requiring an equal amount of intellectual culture, seems to me, under existing circumstances, the most natural thing in the world. I therefore very cordially agree with "one who likes small deeds better than large words." We *do* want a photographic society which shall make the art element its most prominent feature, and I, for one, should be happy to co-operate with others who may think such a want should and could be supplied. There is a very extensive field open for an active and enterprising first class society, which will not be content to assume no more importance, in connection with the advancement of the art, than that of a small social club of idle members whose proceedings merely assume the form of light or frivolous impromptu gossiping about the minor details of an apparatus or a process. I do not see the slightest reason why such a society should not become a really elevating representative of the art. There are many able gentlemen who, having lost all hope in the active utility of the present society at King's College, might, I feel sure, be confidently looked to for assistance; and there are many others who feel that the meetings of smaller societies, however friendly and social they may be, are wanting in the earnestness and dignity essential to greater and more important ends.

My object in writing is to lay before your readers the above views and suggest that such of them as agree with me in desiring the formation of a photographic society of England for the elevation of photography as an art, and consequently as a science, should forward their names, directing such communications to the office of the Photographic News. I enclose my card, and am, dear sir, yours truly,

A Photographer and Artist.

AMATEURS PHOTOGRAPHIC ASSOCIATION.

Dear Sir,—Whilst the Amateur Photographic Association has elicited an outburst of approval far exceeding the most sanguine expectations of its projectors, some few objections or queries have reached me, which deserve, I think, to be noticed.

I will, for the sake of brevity, put them in the form of question and answer.

Objection 1.—Is it just that the prize negatives shall become the property of the publishers when the prizes are paid for by the Association?

Answer 1.—The prizes are *awarded* by the *Committee*, but *paid* for by the *publishers*. This objection, therefore, falls to the ground.

Objection 2.—Is it not an anomaly to declare that "none but amateur photographers shall be admitted as members," or in plain words to exclude the profession, whilst the fact is that as soon as a photographer takes to selling his pictures he becomes a professional, for professionals do no more?

Answer 2.—This objection I have placed in the strongest possible light, and it is exceedingly plausible; for although we well *know* the difference between an amateur and a professional photographer, yet it is difficult so to define the terms as not to lay oneself open to criticism. Suffice it, however, to say, that whilst an amateur photographer is one who is wholly independent of photography, but practises it for the love of it, and who will love it none the less should he find that the public are glad to purchase copies of his pictures at such a price as to make his amusement self-supporting. A professional photographer is one whose income upon which he depends is derived wholly or in part from the practice of the art.

Objection 3.—Will not the selection of prints, the choice of negatives for publication, and other matters connected therewith, be apt to engender feelings of dissatisfaction or even mortification?

Answer 3.—It cannot be expected that a scheme so complicated and comprehensive will be altogether free from difficulties; and if the rules are somewhat vague on certain points, it is because it is thought that there are matters which will be better left to the judgment of management and the committee of referees, and the public may well rely upon it that they will act with an impartiality above suspicion, that in no case need members select pictures inferior in quality to the negatives which they send, and that justice and liberality will be shown to all. In conclusion, Sir, allow me to add that although (as you well know) no thought nor labour has been spared in drawing up the rules, yet we do not pretend that the thing is yet perfect; but we do confidently believe that it is so substantially good that we may reasonably hope to make it so.—I am, dear sir, very faithfully yours, A. Melhuish, Hon. Sec.

P.S.—Since writing the above I have received a letter from the chaplain of H.M.S. ——, in which, after characterizing the association as "the very thing we have long wanted," the writer asks one or two questions which suggest to me that it may not be unnecessary further to mention that the publishers alone are responsible for all expenses incurred, and no member can, under any circumstances, be called upon for anything beyond his yearly subscription, which, as usual, is payable in advance.

Photographic Notes and Queries.

Various Queries.

Sir,—You will oblige an old reader of the Photographic News by giving a reply to the following queries:—

In No. 138, referring to the new process by Capt. Dixon, you stated the preparation was just going to be patented. Is the specification completed? If so, will you give your readers a copy, or is the preparation for sale?

2. In No. 141, you refer to a new dry process by Rev. L. Sisson. When are you likely to give full particulars?

3. Mr. Joubert some time ago stated that so soon as he had matured his process he would give to the photographers of England full details; is there any word of his doing so? If not mature why advertise for printing by an incomplete process?

4. In preparing an iodizer for my plain collodion, I use occasionally one or other of the following:—Iodide potassium, 2 grains, iodide cadmium, 2 grains, bromide cadmium, 1 grain, chloride cadmium, 1 grain: or iodide potassium, 4 grains, bromide of calcium, 1 grain, tincture of iodine, 1 drop; are these good for positive collodion, or will you oblige me with a better?

5. In 1851, without consulting an experienced photographer, I purchased a full plate combination lense for portraits and views 3¼ inches diameter, made by Lerebour. Finding myself unable to obtain facilities for taking portraits I have for a long time spent leisure in copying engravings and taking instantaneous views from the window, using a small stop of one inch; still I am not satisfied. The picture, somehow, is far from being sharp and is much out of focus; some distance from the edge I have tried various proposed plans to obtain a flat field sharp picture without losing light, but ineffectually. Can you help me? or is my lens, being not so good as at present made, likely to require me to sell and get one better suited? By using a small concave lens midway with lenses I obtained a large field and flat to the edge, but the picture on the ground glass appeared misty and not sharp.

6. Mr. Crookes in the early No. 8, page 86. Photographic News, referred to a new metal discovered by Sir J. Herschell, called Junonium, which promised to rival silver. Can you give any information on this point?

I have troubled you on a number of points, but I believe all less or more of interest to amateurs, &c.—Yours truly,

Glasguensis.

Glasgow, 4th June, 1861.

[1. The process is patented. Specifications are never accessible until they have been lodged six months. We believe the process is not yet sufficiently perfect to warrant the sale of the preparation. 2. As soon as sufficiently tested. We hope shortly. 4. M. Joubert stated that he would make his process known when it was sufficiently matured to be placed safely in anybody's hands, but that at present it required nice skill to work it creditably. That skill he can secure under his own superintendence, but it might not be found in everyday manipulators. You must distinguish between an incomplete process and one requiring more than average skill to work it successfully. 4. Either of your formulæ are well suited to positives; but unless you have much water in your alcohol you will have an undissolved precipitate in the collodion from the second formula. With potassium as the only base of the iodizer it is difficult to get much of a bromide into the collodion—in our only experience barely half-a-grain to an ounce. A little tincture of iodine would probably improve the first formula. We apprehend the whole of the chloride is not dissolved. 5. Regarding the lens it is very difficult indeed to give an opinion without seeing its work. The manufacture of photographic lenses has improved very much since 1851, but Lerebour is a good French maker. You cannot gain much by introducing any other lens at random. Probably you would do well to sell it and get another. 6. We have not any recent information regarding the metal referred to.—Ed.]

Developing Box.

Dear Sir,—I have just made for my own use a plain, useful, and inexpensive developing box for out-of-doors photography. Thinking some of your readers would like to make a similar one. I beg to offer the following description of it.

The box is of half-inch deal, 26 inches long by 13 wide, and 11 inches deep. Through the bottom on the right-hand side is a hole 10 inches by 4 inches, through which my box holding the bath drops level with the bottom; at the back is a square of yellow glass, 10 inches by 4 inches; at each end a circular piece of the same 4 inches diameter; in the front are fixed two sleeves with elastic bands to close tight to the arms and exclude white light.

The lid is made to fit on without joints, and I have a square of yellow glass fitted in a frame in the top of the lid to see through, and made loose to prevent the necessity of taking the lid off for changing plates and taking the dark slide out. I have a black cloth tacked to the back of the box to cover the head while working. The box stands on three legs, two at one end and one at the other, which screw into blocks at the bottom and pack inside the box when out of use. Over the whole I have a cover made of American cloth and a handle at each end for convenience of carrying.

It will hold all necessary things, such as camera, folding stand, plate, boxes and chemicals. C. S.

P.S.—The whole cost of the above I think would be under 10s.

[One of your old correspondents, Mr. Barrett, of Reigate, recently showed us a very convenient operating box for the field, which, in many respects, resembles the one here described. We hope to describe it shortly.—Ed.]

The Fothergill Process.

Dear Sir,—I would advise all who want a good and certain *dry* process to use the Fothergill process as practised by Mr. Howard, which was published in the News a few months ago. I had tried almost every dry process with their several modifications without any great success, and was almost giving the dry process up in despair, when, seeing Mr. Howard's manner of working, I determined to try once more, and I am glad I did. I began with great care, and attended strictly to having every thing in the most perfect order. The collodion I use is some I prepared myself last summer, and which I set aside, after trying, as useless. I can go out on Saturday afternoon with my dozen plates in a *deal* box lined out with brown paper, and the Photographic News in my pocket, and read away while a plate is being exposed, feeling as happy as a photographer ought to (when he feels *assured* that his dry plates will turn out well). I send you three specimens of views from dry plates.

I find that one of the *greatest* causes of blisters is imperfect washing after the albumen is applied. Now last week, while preparing some dry plates, I inadvertently omitted to give a plate three washings (Mr. Howard's manner) only giving it one, and, on developing, it became covered with blisters.

I have tried Mr. Hannaford's modification with perfect success; but not having any prints finished, of course I cannot forward any at present. The plates I operate upon are stereoscopic.
Yours obediently, Teesdale.

[Our correspondent's prints suggest that he will become a worthy pupil of Mr. Howard.—Ed.]

Talk in the Studio.

Photography and the Exhibition of 1862.—The *London Review*, speaking of the proposed classification of photographs amongst cart wheels, &c.: "We can imagine a commission composed of men having no more acquaintauce with photography than can be gained by looking into shop windows, placing a photograph in the third class, by the side of woven fabrics, lace and embroidery, paper-hangings, and papier-mâché; the "tea-board" style of art exhibited in some photographic perpetrations being about as artistic as the ornamental design on a papier-mâché tray; but what possible confusion of ideas in the minds of the Commissioners could have led them to class a photograph as a tool. In any case it is a *result*, and as such the Commissioners are bound by their own classification to place it along with the other results of machines acting upon the raw material, even if they refuse to give it admission among the Fine Arts. As it at present stands, it is the only exception in the whole classification. it is the only result involving intellect and design, which is degraded to the level of the machine used in its production. The very paper and glass upon which a photograph is taken is ranked as more worthy than the finished *picture*. The incongruity is as great as if a painting by Raphael were placed below brushes and colours, or as if the Venus di Medici were exhibited as a raw material, by the side of a block of marble of less importance than the chisel and mallet used in her sculpture."

Photography made Easy.—Among the numerous handbooks, which are to do so much for us in this world, such as cure "all the ills that flesh is heir to," make our fortune, marry us happily, &c. &c., one is now published according to the well-circulated handbill, now before us, by which "any careful person may, the first trial, produce a good photograph as certainly as a carpenter can produce from wood a stool or chair." We may as well therefore remind the gullible that even to produce a stool or chair requires some skill and experience, and that even carpenters do not become such without an apprenticeship.

Adulterations in Paper.—Two correspondents of the *Times* have recently called attention to the serious extent to which the use of earthy matter has been used in the manufacture of paper of late years, both by English and Continental makers. As much as thirty per cent. of white clay, and other earthy matters, amongst which are silica, alumina, &c., have been detected in samples professing to be of good quality. How far these substances are present in photographic papers, and how far many of the printing troubles of the photographer may be due to such adulterations, we cannot here enquire. But the subject is worth attention.

Dropping Bottle..—We believe many pictures are spoiled in development, from the uncertain amount of silver added to the developer. An attempt is made to pour a few drops from the lip of an ordinary bottle, and possibly four drops fall, and quite as possibly a little stream containing twenty drops. To remedy this difficulty, a dropping bottle should always be used, by which a definite quantity can be added, and the number of drops regulated absolutely. We have received from Mr. S. Highley a neat and convenient dropping bottle of his invention. It consists of a stoppered bottle, in the stopper of which is a capillary aperture which admits readily of the discharge of one drop of the contents at a time, and no more. To prevent evaporation, and the clogging of the aperture with dust, &c., a cap fits over the stopper. The whole is neatly packed in a turned wooden case, which permits it, no matter what its contents, to be carried safely in the pocket. Another use for which this bottle is admirably adapted, from the precision with which it discharges a drop at a time. is for adding nitric or other acid to the bath, an operation in which excess is fatal. The bottle is manufactured by Mr. Eve of Holborn.

Grand Historical Picture of Garibaldi.—Mr. Barker's great "sensation picture" of Garibaldi was, we understand, entirely painted from photographs. Some critics state that Mr. Barker's painting is less true to nature than the photographs which formed his studies.

Birmingham Photographic Exhibition.—The opening of the Exhibition at Aston Hall, has been delayed longer than was intended. The arrangements are, however, rapidly in progress, and it is hoped that the Exhibition will be fully opened shortly. We shall give some particulars of the pictures exhibited in an early number.

To Correspondents.

T. Y. K.—Your prints are simply not fixed. An immersion of one minute would scarcely be sufficient to fix them, even if you used a saturated solution of hypo, much less a solution only containing one part of hypo to twelve of water. Use a much stronger solution, not less than four ounces of hypo in a pint of water, and let the print remain in at least ten minutes. In order to prevent the hypo turning the print too red let it remain in the gold toning solution a little longer. You must wash, moreover, for as many hours as you have done minutes.

A Poor Photographer.—You can make oxide of silver in the way we have described from a portion of an old bath. You do not state whether you are working negatives or positives; but from your remarks we infer the latter. If so, the free addition of nitric acid, say half-a-dozen drops to a pint of solution might possibly meet your case. Try that, as it is easily neutralized with oxide of silver, afterwards, should it not remedy the evil. Should it fail to do so, then you may add oxide of silver and place the bath in sunlight, and afterwards filter and add nitric acid a drop at a time until the bath works properly.

Robert Thomas Wright.—Any grease which may be in the inside of the worm of your still will be removed by washing with a warm solution of common washing soda, and then rinsing well. The presence of grease would be very easily seen floating on the top of the distilled water. You may easily test the water by adding a little nitrate of silver to it. If you have any doubt about it, add a little oxide of silver to the bath when you make it, and place the solution in the light. Any organic matter present will be blackened and precipitated. Then filter and acidify as may be necessary.

J. P. C.—Possibly your printing bath is alkaline, which would favour the rapid discolouration of paper. In that case add a little citric acid, or a drop or two of nitric acid. Moisture in the atmosphere where the excited paper is kept favours the rapid discolouration; therefore the paper should be kept in a dry place after exciting. If you cannot tone prints immediately after printing it is better to keep them in a drawer or box in a dry place until you can, than to keep them many hours in water. Gas burning in the room would aid the discolouration. Mr. Gulliver's method of painting backgrounds is on p. 165, No. 135.

Teesdale.—Your paper is unquestionably at fault; there is no remedy but trying another sample. 2. It is quite possible that your collodion is at fault, and not your bath, but from your description the lines and stains appear to be caused by the draining of the silver running back on to the plate during development. On removing a plate from the nitrate bath let it first drain a minute or two into the bath; then carefully wipe the back with blotting paper, and let the plate rest a minute on blotting paper to remove all excess of silver. 3. The prints are very good. "The Dairy Bridge" is best. The "Abbey Bridge" just lacks a little brilliancy. The "Railway Bridge" will be doubtless a very good subject for the stereoscope, but of its stereoscopic effect we can say nothing, as you only send one half. It has the least pictorial value. The scenes are all familiar to us, and very interesting from early association.

A would-be Photographer.—If you send us your address we can give you the information you desire. A very fair half-plate equipment for commencement can be had for £10.

J. G. D.—In making a silver bath for negatives dissolve 35 grains of re-crystallized nitrate of silver, in each ounce of distilled water. Immerse a coated plate in it for an hour or two, and then proceed to try a picture. If the silver have been pure and good, you will probably get good results. We have frequently done so. If not, add a little oxide of silver, let the bath stand in the light a few hours, filter, and then add either a little acetic acid, or nitric acid; if the latter, in infinitesimal doses. 2. The chloride of silver precipitated from silver solutions is easily removed by decanting away the supernatant water.

J. H. and some other Correspondents.—We have no personal connection with advertisements which appear in our columns, and specimens or other things left at our office, are there for the convenience of advertisers and those readers who may desire to call and inspect. We cannot undertake to give opinions or descriptions of articles so advertised. The camera in question was, we understand, sold a week ago.

N.—We are not aware whether it is absolutely known what is the dessicating agent used in Marion's preservative case, but believe it is generally understood to be chloride of calcium. One grave error in the construction of the case, is the absence of any facility for taking out the chloride and drying or replacing it. As it only acts in virtue of its power of absorbing moisture, it must be constantly deteriorating both from water absorbed from paper placed in it, and from the atmosphere, and thus eventually become charged with water. It would appear that in this case the chloride having become supersaturated with moisture, deliquesces, and runs off as described. Chlorine would of course discharge much of the colour of blotting paper stained with nitrate of silver. The only remedy will be to take the case partly to pieces and renew the chloride. We shall be glad to hear from you on the subject named.

F. M.—Do not add nitric acid to an iron developing solution for negatives. Acetic acid or citric acid should be used. The latter keeps the shadows clearer.

R. H. C.—We have some important information to communicate on the subject in our next.

M. H.—A portion only of the article has appeared. We will give a *résumé* containing all that is important, as soon as it appears complete. See article in present number.

W. G.—The particulars of M. Joubert's process have appeared in our columns, and our correspondent can compare his own method therewith and ascertain how far it is likely to infringe M. Joubert's patent. We believe M. Poitevin's perchloride of iron process is not patented in this country. Our correspondent can procure M. Joubert's specification from the Patent Office.

L. and several other Correspondents in our next.

Mr. Sandfords' and several other advertisements are compelled to stand over until next week for want of space.

D. Hills.—We have a letter for this correspondent if he will forward his address.

Mcs.—In our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 145.—June 14, 1861.

GALLIC ACID AS A PRESERVATIVE.

The value of a solution of gallic acid as a preservative in connection with several of the dry processes as suggested by Major Russell aud Dr. Ryley, has already been proved. It was illustrated to us in a striking manner the other day by Mr. Morley, who has been in the habit of using it as suggested by Dr. Ryley. Having prepared some ten-by-eight plates by the Fothergill process, using dilute albumen only, without either ammonia, chloride of any kind, or any organic salt, washing well before and after applying the albumen, they were dried and put away ready for use. On examining them, however, in the dark room, prior to exposure, it was found that they were much stained, and altogether unsatisfactory-looking, apparently from the use of badly-cleaned plates. It occurred to Mr. Morley, from what he had observed of the action of gallic acid, to try an application of it to these plates. One was taken as a trial, and the gallic acid solution poured over half of it, left to dry, and then exposed and developed. The result was most remarkable. That part of the plate which had not been treated with the gallic acid, was not only stained, from the plate being dirty, but the image was feeble, muddy, indistinct, and worthless. That part coated with gallic acid, up to every edge marked by its irregular flow, presented a clear, rich, brilliant, vigorous image; full of detail and crisp definition. Stains of every kind which might have existed in the film, seemed quite ignored, and that half of the plate had as perfect a negative image as could be desired. The exposure was four minutes, in a moderate light towards evening, with a lens of thirteen or fourteen inches focus, and a small stop.

One or two persons to whom we have mentioned this this method, and who were in the midst of some fogging difficulties with their Fothergill plates, have tried this remedy with the most complete success. We commend it to the attention of any of our readers, in similar difficulties, and shall be glad to hear of the issue.

BIRMINGHAM PHOTOGRAPHIC EXHIBITION.

It is we believe five years since an exhibition was held iu connection with the Birmingham Photographic Society, and the result on that occasion was a pecuniary loss. Notwithstandiug a discouragement of this nature, with that courage and enterprize which has placed Birmingham as one of the first manufacturing towns in the world, the society resolved to illustrate once more the progress of photography, by establishing another exhibition. On this occasion we are happy to believe the arrangements are such as will preclude the possibility of any very heavy pecuniary liability either by the society or its officers.

The exhibition is now held at Astou Hall, a place which, if it have the disadvantage of being a few miles out of the town, possesses also its own attractions of positiou, scenery, association, and the vast interest of its collection of curiosities in nature and art. Aston Hall, as some of our readers may be aware, is a fine old Elizabethan mansion, situated in a noble park a short distance from Birmingham. Possessed of many interesting historic associations, not the least of which is the fact that it once gave shelter to the ill-fated monarch Charles I; it has passed through many fortunes until, in the year 1857, a company was formed by gentlemen interested in preserving to the town the advantages of a park, aud place of amusement, who purchased the Hall and as much of the park as remained intact. The interior is converted into a museum of natural and artificial curiosities with which it is in many respects well furnished, and was inaugurated by Her Majesty in 1858. It is in some of the rooms of this ancient building, and forming for the time one of the features of attraction of the place, that the photographic exhibition is opened.

In using the term opened we are scarcely strictly correct. From the tardiness with which contributions were at first forwarded, the arrangement and cataloguing were unavoidably delayed, and we regret that in our necessarily short visit we were unable to see the display in that state of completeness which it promised in a few days to assume.

The pictures contributed at the time we were present, numbered upwards of 360, and more were promised. Of these, many we had already seen at the London Exhibition, but there were amply sufficient novelties to give the exhibitiou a distinctive character and individualism of its own, and render it well worthy of a visit. Foremost amongst these characteristics are the stereoscopic transparencies of Mr. Breese, a member of the Birmingham society. Of these pictures we shall speak more in detail next week; but we may here remark that they far surpass in wonder and beauty anything of the kind we have seen. We do not simply refer to the interesting instantaneous pictures, representing the streets of Birmingham during Her Majesty's visit to inaugurate the hall of which we have spoken, the views of which elicited Her Majesty's high commendation, but to the wonderful representations of clouds, water, and atmosphere, rising and settiug suns, and, most marvellous, moonlit scenes. A series of pictures from China, the display of solar camera pictures, and some other excellent pictures all coutribute to give the distinctive character to which we have referred.

More immediately associated with the department of the Hall devoted to Chinese illustratious, but as possessing high photographic interest, we may first mention the photographs from Chiua, contributed by Philip Cohen, Esq. Amongst these are photographs of the summer palace of the Emperor, which was sacked in the war, and of various scenes in connection with the war. Some of them possess a horrible and ghastly interest: scenes immediately after the couflict, in which the bodies of the slaughtered Chinese are scattered around, and in some cases blood trickling from their wounds, all of which is rendered with a sickeuing fidelity. A panorama of Pekin is upwards of six feet long. The pictures, although somewhat marred by spots and pinholes in the negatives, apparently from dust, are full of detail, and in many respects very good photography. We have uo information as to the artist, but are disposed to attribute them to Signor Beato, who, it may be remembered, was described by the *Times* Chinese correspondent as being present with the army at the time.

First in position in the catalogue, and in many respects taking priority in interest, as being the first time they have been invited to a formal competition for medals, stand the solar camera pictures. Of these there are about twenty-one: four contributed by Augel of Exeter; six by Smyth and Blauchard of London; three by Atkinson of Liverpool; five by Turner of Birmingham; and three by Pickering, of Birmingham. Four of these are coloured, and one worked up iu black and white. Amongst the coloured ones a very large portrait of the late Rev. J. Angel James of Birmingham, by Mr. Turner, will attract most attention. The size of the picture is 44 in. by 34 iu. The position and expressiou are easy, natural, aud characteristic. The painting is good and the effect throughout such as will, we apprehend, leave little ground for hesitation in the judges regarding the best coloured picture. The uncoloured duplicate is present for reference, but is not hung. It is on a sheet of double elephant drawing paper, a few inches each way less than the painted copy. The likeness in it is good, but the print is a waste copy, stained and imperfect. The high esteem in which the deceased minister was held in Birmingham must give a peculiar interest to such a life-like representation of him. Mr. Turner's uncoloured pictures do not please us so well. He uses, apparently, negatives sufficiently dense for ordinary printing purposes; and hardness, mistaken for great vigour, is the consequence. His prints are developed too long, and acquire a greenish tone.

Mr. Angel, of Exeter, exhibits four very fine prints, which at the distance from the eye at which they are hung leave nothing to be desired, unless it be a little more warmth in tone. Two of his prints are groups of full-length figures, on whole sheets of photographic paper rather closely trimmed. One, a charming picture of two young ladies in walking costume. The drapery in this picture is very exquisite, and if there were a little more modelling in the face it would be perfect. Another is a group of four children, well posed, and satisfactory in general character. Two others are busts a little less than half the size of life, which present some sharp, vigourous, and clean photography. The whole of Mr. Angel's prints appear to be on albumenized paper, sun printed and toned with gold, in contradistinction to the others, which are developed prints on plain paper.

Smyth and Blanchard contribute six, all on the ordinary whole sheets of photographic paper. These are very unequal in merit, three or four are very good, one indifferent, and one very bad, being hard, flat, and unpleasant in tone. Two large vignette heads are very good, and two large heads not vignetted are also good, but the other, with more of the figure, will not compare with those of the same kind of Mr. Angel. The best of these, and those of Mr. Angel, will run very closely in competition: the latter are more delicate, and the former more bold in treatment. Those of Smyth and Blanchard are all developed prints, and the tones of the best as fine as can be desired. Some of these prints present a very slovenly appearance, being sent without frame or glass; and the mounting boards warping, spoil the effect materially. Such a practice cannot be too strongly deprecated.

The three large vignette heads, sent by Mr. Atkinson, strike us as being very unsatisfactory. Two of them are very flat, and the third, although possessing a little more modelling and somewhat bold, is still hard and crude. Of Mr. Pickering's enlarged pictures, two are coloured, and one worked up in black and white, and do not present much ground for photographic comment.

We believe there are four solar cameras in Birmingham; but only two of the artists of the town have at present contributed enlarged pictures. We are somewhat surprised to see so few of the names of the Birmingham artists amongst the contributors; the more so as in our walks through the streets we were struck with the large number of show cases belonging to professional photographers, in many of which some excellent specimens were exhibited. Perhaps their contributions have yet to be sent in, and the thing which from its easiness may be done any day, is being delayed, as is the too prevalent wont of human nature under such circumstances.

Among the general contributions are, as we have said, a number of old favourites, in both landscape, portraiture, and *genre* subjects, together with new ones which ought to become favourites. Here is a fine display of Bedford, and Mudd, and Heath, and Rejlander, and Robinson, and Claudet, and Wall, and a 'host' of others. There are immense pictures from waxed paper negatives by Rogerson of Manchester, views from the Crimea and Constantinople by Robertson, and from Corfu by Major Shakspeare. We must, however, enter into further detail in another notice.

Notes and Jottings.

No. 7.

Suggestive Experiments on the Resin Dry Process—Keeping Qualities of the Albumen Solution, and of Prepared Plates in Modification of the Fothergill Process.

The resin process for dry plate photography, if it could be relied on, would assuredly be the most simple.

Considering the very minute quantity of resin recommended to be added to collodion, it appeared to us probable that a small portion of benzole or naptha would answer the same purpose, and work cleaner. The benzole or naptha should be somewhat impure, so that on a portion being evaporated, a resinous matter may remain. Parrafin, "or other similar substance" may be employed in like manner.

The few experiments we have made in this direction, give sufficient promise to induce us to continue them at an early opportunity. The plates were very sensitive, requiring not one-half the exposure of those by the Fothergill process.

Instead of adding the resinous oil to the collodion, it may be largely diluted with water and applied to the washed sensitized plate as a preservative. The film should be thoroughly washed and drained, and the solution, after having been allowed to stand for some minutes, washed off. We cannot with certainty give the best proportions in which the above mixtures should be made. Perhaps from 5 to 10 minims of benzole, &c., to the ounce of collodion, or twice that quantity to the ounce of water, will be found to answer.

The film, however, by either of these methods is not so compact as could be desired, and unless the last washing be thoroughly effected, stains will arise.

We think it probable that resin, or resinous oils, either mixed with collodion, or applied as a preservative, will be found to give a more sensitive dry process than any other yet published.

Some doubt has been expressed as to the length of time the mixture of silver with albumen, for the modification of the Fothergill process, will keep. We have lately used some over two months old as good as when first made.

A plate prepared six weeks before exposure, showed not the slightest sign of deterioration, and we consider that if the last washing has been effectively done, the plates by this process may be kept for any length of time.

Michael Hannaford.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.*

Grace.—One of the attributes of beauty, which invariably produces a pleasing effect. A portrait of the homeliest woman, if gracefully posed, will convey an impression of beauty to the spectator's mind. *Grace* may exist in a thousand ways, and in connection with a thousand things, and yet be equally effective in each. We find it, for instance, in animate and inanimate objects; in the arrangement of a single figure and the disposition of parts in a composition; in the expression of the face, the folds of drapery, and in the action of the body and limbs; in the droop of plume-like boughs, the sway of the green grass, and the grouping of forest trees: or in the contours of the noble horse, the gamboling grey-hound, the timid deer, the swan, and the bounding stag. *Grace* should always be sought by the artist photographer, whether his search be carried on in the wide out-of-doors studio, or the little blue-blinded glass room. Nature is lavish of it, to all whose minds have taught their eyes to see it, although night-blinded bats, whose eyes are nothing more than mere mechanical guides for their hands and feet, never recognizing either this or

* For *gamboling* in the quotation from Rejlander's paper under the head "Glazing," read *gambling*.

kindred qualities, refuse to seek, or even deny its existence. Jarves, an American writer on art, says—"Sublimity may be considered, for the present, as out of the power of art; except in a merely suggestive sense. *Grace*, however, is completely within its power. The artist who fails therein has no calling for art. *Grace* is everywhere. There is not a line of nature or created object, but, in some form or other, develops this quality. Therefore is the artist inexcusable who lacks its spirit." *Grace* varies in its character, for it may be homely and familiar, subtle and refined, or majestic and retiring. The gracefulness of motion has already been the subject of remark in these articles (see *Action*, *Attitude*, &c.), and the quality has been shown to be very closely allied thereto. Among things destructive of grace, the most common will be found to exist in a want of proper harmony, or keeping,* and in the presence of harsh contrasts and crude abruptly angular outlines; but the quality itself is hard to define, being so frequently felt without being understood, and clearly recognized without being traced to its source. I will not, therefore, dwell longer on this subject.

Grouping.—The great law of composition, viz., *Unity*, is also the chief element in artistic grouping. It is tolerably well known that, with this end in view, the best form of composition, in grouping, is the pyramidal; but it seems to be a fact very much less known, that, although such is the case, the pyramid should not be so arranged as at once to suggest the intention of the artist. When a group of figures assume this form, it should appear to result from the merest accident, and be perfectly natural and consistent. No one figure should have the appearance of being posed in a certain way *merely* to complete the pyramidal figure of the whole; but, while actually doing so, should suggest some other cause for its appearance more strikingly intelligible to the unprofessional spectator. In photographic groups of three, we frequently find them posed in the tit-tat-toe order, with two figures seated, one on either side of another standing: here it is true the pyramid has been secured, but what can be more formal, stiff, and ugly; or less suggestive of anything but three tasteless people sitting for a vulgar portrait to some lamentably pictorially ignorant operator. Art is deeper than the mere surface quality of common-place artifice; and a group is not artistic merely because the tallest figure stands in the middle. In a group also—and here lies a photographic difficulty which "composition" printing finds its best reasons in†—the figures should not be all "drawn up" exactly in one plane. The better arrangement, if the form of lenses would permit, would be that which makes the more central figures prominent, and those at the sides receding. It is almost impossible to lay down rules applicable to all cases, because such are liable to be influenced by so many other principles, more or less peculiar to different works. I shall, therefore, merely suggest that the forms into which groups are most frequently arranged are the pyramidal, dome shape, oval, circular, and spiral, as influenced by the laws of *Proportion*, *Balance*, &c., and above all, by *Expression*.

In landscape it is astonishing what capital foregrounds may sometimes be got by a little artistic grouping of the stray articles chance may place within reach. A large broken bough, dragged into a judiciously chosen position; a few large stones and weeds; a dilapidated wheelbarrow; a few farming implements; some old peat-baskets; a stray male or female, or male and female rustic; a horse or cow, hunted into the right position; a picturesque ferry-boat—all these, and many other things, when appropriate to the locality; and the sentiment of your view will compose into the most charming and effective foregrounds, with no other trouble—if you have the proper knowledge of pictorial effect—than that of a few thoughts, and a little careful observation. In grouping or massing these together, remember their effect in reference to the other laws of pictorial art, so as not to destroy the unity or repose of the *composition*; this last effect being the result of *subordination*. The use of such chance-found accessories, when grouped as described above, may also aid in securing breadth of chiaroscuro, or gradation of tones by supplying such half-tints as are required to unite two opposing masses. Much could be advantageously added on this subject, perhaps; but these papers having already extended over as much space as I originally intended they should occupy when complete, the reader must excuse me if I begin to be somewhat more purely and briefly explanatory in my treatment of the terms yet remaining.

Harmony.—The great sources of harmony are unity, repetition, and proportion. If you are about to print a picture containing many objects from a set of negatives taken at various times, be careful that there is such similarity of tone and gradation in each as may be consistent with the peculiar conditions of light, shade, &c., under which the whole is supposed to exist; otherwise, your picture will be out of harmony. In a properly harmonized picture one part, will be in perfect agreement with every other part; lights of the same character or kind will be of the same relative degree of brilliancy, and shades of the same relative degree of depth throughout, harsh isolated sections will not exist, and every part will blend and unite with every other part in tones, lines, and general disposition of parts. Considered away from "composition" printing, and, with reference to harmony of tones, I may remind you that the various parts of a picture must be regarded with the feeling due to a well-composed piece of music, in which one particular key rules the whole. Upon the exposure, development, and printing combined, this quality must be dependent so far as regards the proper *harmony of tones*; but beyond this we have also to consider the *harmony of expression*, *harmony of proportion*, and *harmony of effects*. I cannot hope to make you thoroughly understand this quality, it being so much more a thing for feeling than reasoning about; but seeing the harmony of a good picture should engender in you the same sensations that would arise from hearing the harmony of good music. The two things are essentially the same.* In one of Ruskin's works—I forget exactly which—he speaks of this quality as being to a large extent too subtle for definition; and I am therefore sure you will not expect more from Wall the pigmy, than you can get from Ruskin the giant. To illustrate harmony of expression, however, we will, if you please, appeal to our imaginations.

The sun has gone down beyond the distant hills, which rise, ghost-like, against the pale gleaming light of the western horizon. A misty gloom spreads over the whole scene, and the dark forms of the distant trees, with their rounded heads and drooping boughs, defined against the pale greenish light above the hills, show like hooded mourners bending above the grave of departed day. The sad-voiced breeze sounds sigh-like. The mournful solemnity and mystery of night's approach shows everywhere; in the mystic depths of violaceous gray above, and in the thickening gloom which shrouds objects below. Among these objects, more distinctly visible, because nearer, a deserted plough rests in its half-formed furrow; and a dead lonely oak spreads the angular abruptness of its gnarled and twisted boughs, black against the darkening sky. A thin white face, a shrunken form, clothed in dirty rags, and prostrate, shows where a starving vagrant has crept to breathe his last.

The coming night, the mourners on the hills, the wind-breathed sighs, the plough, speaking of work done, and work

* "That grace and propriety are inseparably united, may be demonstrated from the different languages of both ancient and modern times, in which the words *proper* or *becoming* are, in many cases, synonymous with *beautiful* or *graceful*, and may often be used indifferently the one for the other."—*Cabinet of the Arts.*

† The solar camera may relieve us of this difficulty, and rob the "composition" printers of this excuse, perhaps, by enabling us to get our groups on small plates, and then enlarge them to the required size. I am now preparing some groups for experiments in this direction, taking them with some small Dallmeyer lenses admirably adapted to such purpose.

* I am no musician, or I might probably find, and render you help through a better knowledge of the laws regulating harmony, or thorough bass.

deserted; the lone, dead oak; the thickening gloom, and the mystery which shrouds retiring objects; these whisper silently to our awe-struck souls; but they all whisper of *one subject only*, of that lone deserted vagrant there, with the mists of death, and the darkness of a mysterious night stealing down over his tear-damp couch, in the hushed and solemn silence of the deepening twilight. The dirge has its mournful cadence everywhere; but more than all in our own souls, so that the very beating of our heart almost grows noisy, and to speak aloud seems sacrilege. The sad and eloquent power of *harmony* steals into our full hearts, and gives the tone of our pensive thoughts. If you can imagine some such illustrative picture, (many such have been painted) and conjure up the feelings it would engender, you will have a better understanding of the meaning embodied in the terms, *harmony of expression*, than I could convey by a more common-place method, or by dwelling at greater length on the subject.

Heterogeneous.—Confused, without order; caused by associations out of harmony, or contradictory in their nature, or objects false and out of place in their positions.

High-art.—Frequently confounded with big art, and commonly associated rather with quantity than with quality. A thing more talked of, and loudly, although less understood, than lower art. Too high for the reach of cameramen, but quite as far from the touch of nearly all the best of our modern masters in painting.

Scientific Gossip.

The members of the Royal Institution were gratified on Friday evening last (the concluding meeting of the season) with an experimental illustration of the recent spectrum discoveries. The lecture was by Dr. Tyndall, and was on the *Physical Basis of Solar Chemistry.* He commenced by referring to certain memoranda connected with the absorptive and radiating power possessed by gases on the rays of heat, and then proceeded to illustrate these experimentally. The first was that gases radiate heat in different degrees, some radiating scarcely any, whilst others radiate it in quantity. To render this evident, a thermo-electric pile was placed in connection with a delicate galvanometer. The pile was so arranged that an exactly equal amount of heat impinged upon each end, being radiated from square boxes filled with boiling water; the one face having near it a hot copper ball, resting upon a ring gas-burner (not lighted). The gas-burner was placed by an appropriate arrangement of tubes and taps, in connection with gas-holders of oxygen and of olefiant gas, so that either of these gases could be sent through the ring burner, and passing roundthe hot copper ball would rise up round it in the form of a sheet of heated gas. The arrangement having been explained to the audience, the experiment was performed:—the copper ball was properly placed; the needle of the galvanometer was brought to zero by appropriately adjusting the sources of heat at each end of the thermo-electric pile, and the oxygen was then allowed to flow through the tubes. It passed over the copper ball, rose from it in a highly heated state, and then proceeded upwards in front of the face of the pile. If the oxygen were capable of radiating heat in a sensible degree, it would at once have been rendered evident by a movement of the needle of the galvanometer; no such motion was, however, perceptible; oxygen gas, therefore, radiates no appreciable amount of heat. The same experiment was then tried with the substitution of olefiant gas for the oxygen. A great difference was at once observed between these two gases. No sooner had the warm olefiant gas risen in front of the face of the pile than the needle of the galvanometer showed that heat was being radiated from the gas in large quantities; it was instantly deflected, and in a few seconds had swung round 90 degrees.

The fact that gases radiate heat in different degrees having thus been shown experimentally, the lecturer proceeded to illustrate the different absorptive powers which they possessed. A similar arrangement to the above was employed, only the copper ball was dispensed with, and the gas was allowed to issue through a narrow slit in the front of one of the sources of heat, whence it rose in the form of a thin wall of gas, between the heat and the face of the pile. As before, the oxygen produced no effect upon the galvanometer; it allowed the heat to pass through without absorbing an appreciable quantity, forming in this respect a marked contrast to the olefiant gas, which under the same circumstances obstructed a great quantity, deflecting the needle as much as it had in the former instance.

It was thus shown that gases which radiated little, absorbed little, whilst those which absorbed much radiated much; the proportion between their absorptive and radiative powers being always constant.

The lecturer next proceeded to show that gases did not absorb rays of heat (or light) uniformly: they seemed to exhibit a marked antipathy to certain rays, seizing hold of them, and killing them, whilst other rays on each side were allowed to pass untouched. This was shown in a striking manner in the case of nitrous acid, a cylinder of this gas, interposed in the path of a ray of electric light, which was afterwards passed through an arrangement of prisms and lenses to form a spectrum on a screen, being seen to cut up the colours into alternate light and dark bands, showing that it exercised a kind of preferential action upon some rays of light, absorbing these whilst it allowed others to pass. The converse of this was next shown. Nitrous gas having the property of absorbing rays of light in different parts of the spectrum, other gases had the property of emitting certain definite coloured rays. To show this, metallic vapours were chosen, the phenomena being seen in the most striking manner with these bodies. Retaining the same arrangement for producing an electric spectrum as was used in the case of nitrous acid, the electric light was taken between mercury poles. Instantly a few isolated bands of brilliant colours—red, orange, green and blue—were seen, instead of the continuous spectrum previously given by the carbon poles. The mercury was removed, and poles of brass substituted. These gave the brilliant compound spectrum of the zinc and copper, and the lines due to each element were pointed out, it being at the same time explained that these lines were always constant for the same metal. Whenever the smallest trace of the element was present under these circumstances the lines were produced, and conversely whenever a person acquainted with the different appearances of these lines saw any of the systems, he was as absolutely certain that they were evidence of the existence of the particular metal as if he had the metal itself in his hand; just in the same way as the audience might be equally certain that he was then speaking to them, whether they heard him from a distance or he were whispering into the ears of each individual.

The next spectrum which was shown was the beautiful one produced by strontium (which, however, by a slip of the tongue, the lecturer persisted in calling lithium all the time). This was produced by boring several holes in the ends of the carbon poles, and plugging them up with a compound of the metal—the chloride of strontium for instance. Upon making contact with the battery, the brilliant lines due to this element became projected on the screen, and attention was particularly drawn to the magnificent blue band which was produced in this manner. Sodium was next tried, and the brilliant double line which this produced in the yellow part of the spectrum was exhibited in a very beautiful manner. The spectrum of this metal, although not so beautiful in colour as some of the preceding, is well worthy of attention on several points. It is exactly identical in position and appearance with the line D in the solar spectrum, and this fact first led philosophers to suspect that there was a connection between the two. This has now been proved in the following way:—It was shown that, from theoretical reasoning, a gas which when luminous would emit a ray of a certain refrangibility, would also absorb the same ray if placed before its path. The incandescent vapour of sodium, therefore, which emitted a ray of a certain definite refrangibility, should, according to this reasoning, be opaque to the same kind of ray. To show that this was the case, a very pure spectrum of the electric light was thrown upon the screen, and the position occupied by the soda line in it pointed out. In the path of the light was then interposed a large flame of alcohol and water, in which some chloride of sodium was dissolved; this gave an intensely yellow flame, which was seen to be opaque to the yellow line by causing a black mark to shoot across the spectrum in the position formerly occupied by the luminous line. This was shown in a more striking manner by burning a piece of metallic sodium in a gas flame, in front of the slit of the spectrum apparatus; a jet black line was at once seen to shoot across the spectrum, producing artificially Fraunhofer's fixed line D of the solar spectrum.

The presence of the dark line D in the spectrum of the sun, was therefore shown to be a conclusive evidence of the presence of the metal sodium in that luminary, and in the same manner it was rendered equally certain that the sun likewise contained iron, magnesium, and other metals in its atmosphere. These metals were all necessarily in a gaseous state, and the fixed lines in the solar spectrum were caused by the more highly luminous body of the sun shining through the metallic vapours which formed its atmosphere.

WAY'S ELECTRIC LIGHT FOR PHOTOGRAPHIC PURPOSES.*

It is not necessary that I should offer to you, sir, or this meeting, any apology for the subject I am about to bring under your notice: for the possibility of making the electric light subservient to our purposes in photography, is too important and too interesting to need my excuses.

I cannot, though, commence the observations and explanations I have to make, without asking you to join me in expressing our acknowledgments to Professor Way for giving us this opportunity of witnessing the results I propose to show you.

Most of us are aware that the electric light has not only been proposed, but used, for photographic purposes. At the commencement of our present session, Mr. Malone read a paper in which he stated his experiences with a Duboscq lamp. A somewhat similar lamp has been used in Paris for both portraiture and printing, and I believe at this moment, in this country, Mr. Silvy is using the electric light for enlarging.

The peculiarity of Professor Way's light is in substituting a continuous stream of mercury for the ordinary charcoal points.

The Duboscq lamp, and other modifications of it, Mr. Crookes describes in the Photographic News, as "consisting of a pair of charcoal points separated from each other by a small fraction of an inch, and being connected with the opposite poles of a powerful voltaic battery. The interruption caused to the passage of the electricity produces a brilliant evolution of light and heat, where the electricity bridges over the interval. So far there is no difficulty; but the carbon poles are constantly wearing away, and the space between them thus becoming larger, soon presents a barrier to the further passage of the current, and puts out the light. In order to avoid this inconvenience, many automatic lamps have been devised, in which by the aid of clockwork, electromagnetism, &c., the poles were kept at the proper distance apart."

Professor Way's plan is, as I said this moment, to use in lieu of the charcoal points, a fine stream of mercury, which is made to fall from a jet into a cup. The description and explanation of the lamp is this:—It will be seen that it consists of two parts—the reservoir or cistern for the supply of mercury, and the lamp itself.

* Read at the Meeting of the London Photographic Society on Tuesday June 4th.

The former comprises suitable bearings, carrying two hollow arms, at the ends of which are two globes containing mercury. Either of these globes may be brought uppermost by the rotation of the arms upon an axis placed at their point of junction. The two globes communicate by means of the hollow arms, having holes drilled near the axis with two nozzles on the front of the apparatus; from these nozzles, tubes convey the mercury to and from the lamp.

When the upper globe has discharged all its contents through the lamp into the lower globe, the arms are turned half round upon their axis; the emptied globe being thus brought to the lower position, and the full globe brought to the upper position, by which contrivance a constant stream of mercury is obtained. A gauge tube indicates the pressure of mercury on a suitable scale.

The lamp itself is remarkably simple. The mercury as it comes from the reservoir is conveyed by a tube to a jet, and passes in a fine stream into a cup, and thence, by a second tube, back to the lower globe of the reservoir.

The length of this stream of mercury is adjusted by a rack and pinion, according to the size of the jet and battery power employed. A glass cover encloses the jet and its accessories, and confines the volatilized mercury. The positive pole of a voltaic series is connected with the jet, and the negative pole with the cup.

By the passing of the voltaic current between the jet and the cup, the mercury becomes intensely heated, and the light is produced.

"The light of this lamp differs," says Mr. Crookes, "in character from that produced from charcoal points, and from the lime light, principally in its great volume, appearing not as a single vivid point, but as a focus of considerable dimensions."

To photographers, the striking peculiarity and advantage of this light is, it possesses in a much greater degree than the electric light produced by ordinary means an intensely actinic character. The way in which it modifies the apparent colours of surrounding objects is very singular.

Whether among the important duties it may one day perform for photographers, the taking of portraits is to be one, I know not, but I venture to say, the intending sitter will not think the peculiar hues it imparts by any means flattering to personal appearances. [The gas in the room was here turned down to allow the peculiar effect of the electric light to be illustrated.]

Flowers, dyed wools, &c., are generally altered in colour. Photographers will appreciate the singular modifications effected upon colours when I point out to them that viewed by it the crystals of protosulphate of iron appear absolutely colourless. [The crystals were exhibited, looking rather like hyposulphite of soda than protosulphate of iron.]

Dr. Gladstone says, the prismatic analysis of this light explains at once the various chromatic phenomena. The brilliancy of the yellow, blue, and violet rays accounts for the beautiful colour of those objects which can reflect these rays; while the feebleness of the red shows the reason of the great changes which red substances invariably undergo—sometimes changing nearly to brown, at other times to purple, green, or whatever other colour in addition to red is principally reflected by them. Thus the blood, wherever it shows through the skin, as in the lips, appears of a bluish purple, instead of a reddish hue; and this explains also why sulphate of iron becomes perfectly colourless; for the ordinary green tint of this salt is due solely to its not transmitting with any freedom the red rays; it transmits all others, and therefore all those which prevail in the mercury light. Hence it appears of the same colour as the source of illumination itself, which the eye ordinarily recognizes as white, though, as compared with the sun, it is decidedly coloured.

[Mr. Heath, at this point, placed a piece of sensitized paper upon an easel opposite the Way's light, upon the same horizontal plane as the light, and exposed it for four minutes, and then placed another piece of sensitized paper for four minutes (both pieces being parts of the same sheet) opposite a Duboscq lamp, which Dr. Faraday had lent to Mr. Heath; but to some gentlemen in the theatre, they appeared to be in different relative positions, the last paper being apparently somewhat above the horizontal plane of the Duboscq's lamp. and at a somewhat greater distance than the paper exposed to the Way's light. Upon the two papers being developed and handed round, it was found that the one exposed to the Way's light was much more sensibly coloured than the other. See our report of the meeting.]

It will be remembered that in our late exhibition Mr. Bedford exhibited a frame of photographs which were printed, as a first experiment, with Mr. Way's lamp; and it will also be remembered that these peculiar photographs had all those brilliant, vigorous, and rich qualities for which Mr. Bedford's photographs are famous. One remark Mr. Bedford made as to his results with this lamp I am quite able to confirm—viz., that the light possesses a a singularly penetrating power. For this reason the negashould be somewhat dense, and probably it will result that a paper with less silver than ordinary in its preparation could be used. That is, if, as I believe, the lamp will come into use for printing purposes, we shall have to manipulate our negatives accordingly. An ordinary iron developed negative, which will by diffused daylight yield a most satisfactory print, will not be sufficiently intense to produce a brilliant print by this lamp.

Well, this result obtained in four minutes will demonstrate its penetrating and printing powers. It remains now, upon this branch of the subject, to say something as to the cost of working. The cost of the battery power is 2s. per hour, but what is most needed is to determine the best mode of utilizing the light. At two feet away from the light, I calculate twenty frames may be suspended and by the introduction of reflectors probably more.

Here, therefore, are the facts as they now stand, and upon which present experiments may be based; but as in everything else we must look to future experiments for the real development of its capabilities.

But in another direction, and one too in which the eyes of most of us are now directed (viz., that of enlarging), I think it is capable of affording great help.

I need not explain the drawbacks of the arrangement known as the solar camera. Those who can associate in their practice such a camera with the sunless summer last year, will appreciate some of its difficulties.

But for the Way's light, all that is required is a good magic-lantern arrangement.

I will endeavour to show this, and try to produce a result which shall have sufficiently that is promising about it, to justify my mentioning it.

Mr. Hughes has been good enough to volunteer most important help, by supplying me with a suitable negative and paper, and will undertake the development of the result the light will give us. [See the report.]

TRANSPARENCIES FOR THE STEREOSCOPE.

BY MR. LAWS.*

The subject upon which I have ventured to engage a small portion of your time this evening, is one requiring some person more practised in this particular branch of photography than myself to deal justly with. I have merely done a few transparencies, more as a change from the usual routine of portraiture, therefore I hope you will excuse any shortcomings. I think you will allow that transparencies upon glass, are much finer in the stereoscope than those printed upon paper. Beautiful as Mr. Wilson's stereographs are, how much more beautiful would they be upon glass.

I think one reason why photographers possessing valuable negatives, do not avail themselves of this beautiful process, is, that it gives such facility for unprincipled people to copy. Nothing is easier than producing a good negative from a good transparent positive, in fact the copy is almost, if not quite as good, as the original; in some cases a good printing negative can be got from a very weak one, by first taking a transparent positive, and then a negative from that again; you can get any amount of density in that way. I am much surprised at the amateurs, who, I believe, generally take more stereoscopic views than anything else, not working upon glass, it is a much more pleasant operation than paper printing, and the results are much finer. There are many methods of producing transparencies: printing in contact upon dry plates, is, I believe, most generally employed, there is, however, in my opinion, many objections to that plan; in the first place you must cut your negative in two and remove each half before printing in order to make it correct for the stereoscope, and again two hard substances like collodionized glass screwed closely together in a printing frame, must be attended with great risk to the negative.

Mr. Negretti, in a conversation at the Blackheath Photographic Society, states that he had some negative collodionized plates, which had received three coats of varnish, and yet he never could take a print from them without making holes in the negative. Soulier and Ferrier also print by super-position, but they work entirely upon albumenized plates, so the risk of damaging the negative is less, but still they *are* often damaged. When Soulier's negatives become injured by use, he repairs the proof by retouching in indian ink, he (Negretti) had seen nearly a whole tree put in in a most exquisite manner; now we are not all such artists upon glass as Soulier, for however beautifully damages can be rectified, it still takes from photography something of its truthfulness; therefore, to any of you who wish to produce transparencies, either for the stereoscope or magic lantern, I can recommend the plan I have adopted as being both simple easy, and without the slightest risk to the negative. It is by no means new; my attention was first drawn to it from an article of Mr. Sutton's in the *Notes* some time ago.

The camera I use consists of a long dark box, with a partition from end to end; in the centre I place two ¼-plate lenses, at the extreme end I have a groove for receiving the negatives, at the other end I insert my prepared plate. I fix the camera upon a stand, and point it towards the sky (northern is best); by using very small stops a transparency can be got quite equal to the negative in sharpness. I should have stated that the camera is made in two portions, one sliding within the other. Having placed the lenses at the proper distance from the negative, which entirely depends upon the length of focus of the lenses, I get the image perfectly sharp upon the ground glass by sliding the camera in or out. When no more focussing is required, I then prepare a plate in the same manner as for a negative, by the usual wet process and exposure in the camera; the exposure depends, of course, upon the light and the density of the negative. Negatives full of detail and with very little density give the best proofs. I develop with pyrogallic acid, acidify with citric acid in the usual quantities. When everything is in good working order, fine rich blacks can be obtained without adding any silver to the developer, which ought always to be avoided as much as possible. By placing the negative upside down, with the film outwards, the transparency is taken correct for the stereoscope without cutting the negative. The camera I have described can only be used for negatives taken with the lenses 2½ inches apart; when they are separated more than that, they must be copied with one lens in a camera with the slide made to shift, so that only one half the plate is exposed at once; in a good light there is no inconvenience in this plan, but when the light is bad it is very awkward, the last half of the plate requiring more exposure than the first; the specimens I have brought are backed with opal glass, which I like very much, but it is rather more expensive than ground glass. I think if each of us were to print some transparencies from our negatives, we could spend a very interesting evening next

* Read at the meeting of the Newcastle Photographic Society on the 7th inst.

winter, by having them shown by means of the oxyhydrogen light; but it is rather out of place speaking of winter now with the summer before us, which I hope will show more favour to us photographers than the last.

THE PHOTOGRAPHIC SOCIETY AND THE INTERNATIONAL EXHIBITION OF 1862.

The following is a continuation of the correspondence between the Chief Baron, President of the London Photographic Society, and Her Majesty's Commissioners for the International Exhibition of 1862, regarding the position to be occupied by photographs on that occasion. Our readers will remember the Chief Baron's letter published in our number for May 17. The answer of the Commissioners here follows, together with the further correspondence which has arisen.

Offices, West Strand, London, W.C., May 16, 1861.

Sir,—I am directed by Her Majesty's Commissioners to acknowledge the receipt of your letter of the 7th instant, to which they have given their most careful consideration.

The views of the Council of the Photographic Society seem to be based on a misapprehension of the intention of the decisions published by the Commissioners, as there is nothing in those decisions which would imply that Photography may not be placed either in a separate room or in juxtaposition with engravings, or any other analogous and suitable class of objects.

It is the wish of the Commissioners to do the utmost honour to the exhibition of Photography, and the scientific instruments essential to the practice of that art. With this object they, have removed it from the subordinate position which it occupied in 1851, and have constituted it a separate Class, to which special space will be allotted.

They hope to induce all the exhibitors in this Class to assemble together in one apartment all their Photographic Apparatus and Photography, so as to illustrate fully the state of Photography as practised throughout the world at the present time.

Her Majesty's Commissioners entertain no doubt that this explanation will be sufficient to secure the valuable co-operation of the Council of your Society in the forthcoming Exhibition, as requested in my letter of the 26th ult.—I have the honour to be, sir, your obedient servant,

F. R. Sandford, *Secretary.*

The Rt. Hon. Sir F. Pollock.

Court of Exchequer, Westminster, May 24, 1861.

Sir,—The Council of the Photographic Society have been assembled, and have had laid before them the letter which I have had the honour of receiving from Her Majesty's Commissioners through you.

The Council is most anxious to concur in whatever may promote the success of the Exhibition, either by assisting in the appointment of a Committee, or in affording the most zealous co-operation; but they do most earnestly hope that their claims will be admitted, and their request be complied with—viz., that their apparatus may not be exhibited in the same room with the results which arise from the use of them.

As a science, Photography, like every other science, is incapable of being exhibited. But when embodied in the artistic results with which every one is more or less familiar, Photography, as an art, is capable of contributing to an exhibition matters of the greatest and most universal interest, embracing every variety of object which can gratify curiosity and afford pleasure. It would be most painful to the Council to have, blended with these results, the mere apparatus which they use as tools: neither could throw any light upon the other; and I am desired by the Council to press this upon Her Majesty's Commissioners, and to solicit an interview, when the Council will, by a deputation, wait upon the Commissioners, and explain more at large the views they entertain on the subject.—I have the honour to remain your obedient servant,

Frederick Pollock.

454, *West Strand, London, W.C., May* 29, 1861.

Sir.—I have submitted your letter of the 24th inst. to Her Majesty's Commissioners, and am desired to express their gratification at receiving from you an assurance of the readiness of the Council of the Photographic Society to co-operate with the Commissioners in carrying out the undertaking which has been entrusted to their management.

They will be glad to learn, at an early date, the names of the gentlemen whom your Council would recommend for appointment as a Committee in connection with Class XIV.

Any suggestion which this Committee may make with respect to the position to be assigned to the various objects that they may consider entitled to admission to the Exhibition, will receive the most careful consideration of Her Majesty's Commissioners, when they proceed to the ultimate distribution of space in the building, and to the arrangements connected therewith; but they feel that it would be premature, at this time, to discuss any of the questions connected with this part of their duties; and so many other matters are at present occupying their attention, that they regret their inability to receive the proposed deputation from your Council.—I have the honour to be, Sir, your obedient servant,

F. R. Sandford, *Secretary.*

The Right Hon. Sir Fred. Pollock.

The following is the letter of Professor Playfair referred to in our last.

University of Edinburgh, May 27th, 1861.

Sir,—At the request of one of the Members of your Council, I write to you on the position given to Photography in the classification of the Exhibition of 1862. My apology for doing so is, that I was the responsible officer for framing the classification adopted in the Exhibition of 1851, upon which that of 1862 is founded; and further, that as a Member of the Committee of Organization, the present classification has been brought under my notice by the Commissioners.

You have no doubt observed that the general principle of the classification is to group the raw materials employed in industry, then to group the machinery used to convert them into utilities, and lastly, to group the utilities themselves as manufactured products.

The group Machinery cannot embrace Photography with any propriety. If it has been placed there on account of the apparatus employed in its production, this in itself is a misunderstanding of the principles upon which the classification was framed. Cameras belong to the general class of "Philosophical Instruments," and have no more title to a separate class in machinery than telescopes, microscopes, electrical or surveying instruments, all of which are sections of one class.

But the mixing-up of the photographic pictures with the instruments employed to produce them, when the art has developed in magnitude so as to entitle it to special exhibition, is a gross philosophical error. With equal ignorance, the works of the sculptor and engraver might have been appended to cutlery and edge-tools, or the works of painters to the classes which include brushes made from hair, or to chemical products.

But besides this philosophical error, which will deface the classification in the eyes of foreign nations, who have attended more to its principles than we have in England, the proposed arrangement will be inconvenient for the purposes of instruction, and for the consideration of the jurors who have to judge the works exhibited. The visitor to the Exhibition cannot benefi by the abrupt transition from machinery, in its varied forms, to photographic pictures; and the jurors on machinery cannot be appropriate judges of the relative excellences of pictures.

In conclusion, I may express the hope that your efforts to obtain the alteration in the classification will be successful; and that while photographic apparatus is reduced to its proper rank as a subsection of philosophical instruments, photographic pictures will be raised to the position which they have acquired by the recent progress in the art, by being put in the group of Fine Arts, which is the only place under which they can be consistently classified.—Your obedient servant,

Lyon Playfair.

To the Secretary of the Photographic Society of London.

The following letter has been addressed to the Society's Secretary, Dr. Diamond, to the Secretaries of the various photographic societies requesting an expression of opinion on this important question.

King's College, London, W.C., June 11, 1861.

Sir,—I am directed by the Council of the Photographic Society of London to invite the attention of the body of which you are the representative, to that portion of the Regulations of the Commissioners for the International Exhibition of 1862 which relates to the photographic art.

In the programme published by the Commissioners, Photographic Apparatus and Photography are classed in Section 2, among machines and mechanical processes, instead of in Section 4, in which are placed Sculpture, Painting, Engraving, and all those occupations to which the title of "Fine Arts" is usually applied.

The Council have been requested by the Commissioners to name from among their body a Committee, whose office it will be to take care that the interests of Photography and of its cultivators shall be properly represented in the Exhibition of 1862.

The Council, however, deemed it to be their first duty, before naming any Committee, to point out to the Commissioners the improper classification of the art, and to request that it should be removed from the class of machines and mechanical processes, to that portion among the Fine Arts to which it has so just a claim.

Enclosed for your perusal is the letter of the President of the Society to the Commissioners, and subsequent correspondence.

The final reply of the Commissioners appears to the Council to be so unsatisfactory as to compel the consideration, not only of the question of the appointment or non-appointment of a Committee, but also whether it will not be their duty to recommend those Members of the Society who look upon their art as more than a mechanical process to abstain altogether from exhibiting any of their works.

Before adopting so grave a resolution, they desire to have the advice of the Society of which you are the representative. They have placed the correspondence before the Councils of the French, Belgian, and other continental Photographic Societies, and requested their opinion upon the course which, in the interests of the art, ought under these circumstances to be pursued.

It is their wish that any resolution which they may lay before the Commissioners in their final reply, shall be the result of the united and deliberate opinion of the whole body of photographers, both in England and abroad.

Requesting you to lay this letter before your Society, and of favouring me with a reply at your *earliest* convenience.—I am, sir, your obedient servant, Hugh W. Diamond, M.D.,
Secretary to the Photographic Society of London.

The articles exhibited will, under the present arrangement, be divided into the following Classes:—

Section I.

Class 1. Mining, Quarrying, Metallurgy, and Mineral Products.
,, 2. Chemical Substances and Products, and Pharmaceutical Processes.
,, 3. Substances used for Food, including Wines.
,, 4. Animal and Vegetable Substances used in manufactures.

Section II.

Class 5. Railway Plant, including Locomotive Engines and Carriages.
,, 6. Carriages not connected with Rail or Tram Roads.
,, 7. Manufacturing Machines and Tools.
,, 8. Machinery in general.
,, 9. Agricultural and Horticultural Machines and Implements.
,, 10. Civil Engineering, Architectural and Building Contrivances.
,, 11. Military Engineering, Armour and Accoutrements, Ordnance and Small Arms.
,, 12. Naval Architecture, Ships' Tackle.
,, 13. Philosophical Instruments, and Processes depending upon their use.
,, 14. Photographic Apparatus and Photography.
,, 15. Horological Instruments.
,, 16. Musical Instruments.
,, 17. Surgical Instruments and Appliances.

Section III.

Class 18. Cotton.
,, 19. Flax and Hemp.
,, 20. Silk and Velvet.
,, 21. Woollen and Worsted, including Mixed Fabrics generally.
,, 22. Carpets.
,, 23. Woven, Spun, Felted, and Laid Fabrics, when shown as specimens of Printing or Dyeing.
Class 24. Tapestry, Lace, and Embroidery.
,, 25. Skins, Fur, Feathers, and Hair.
,, 26. Leather, including Saddlery and Harness.
,, 27. Articles of Clothing.
,, 28. Paper, Stationery, Printing, and Book-binding.
,, 29. Educational Works and Appliances.
,, 30. Furniture and Upholstery, including Paper-hangings and Papier-mâché.
,, 31. Iron and General Hardware.
,, 32. Steel and Cutlery.
,, 33. Works in Precious Metals, and their imitations, and Jewellery.
,, 34. Glass.
,, 35. Pottery.
,, 36. Manufactures not included in previous Classes.

Section IV.—Modern Fine Arts.

(*See Decisions* 111–123.)

Class 37. Architecture.
,, 38. Paintings in Oil and Water Colours, and Drawings.
,, 39. Sculpture, Models, Die-Sinking, and Intaglios.
,, 40. Etchings and Engravings.

Proceedings of Societies.

London Photographic Society.*

We resume the report of the meeting of this society, held at King's College on the 4th inst., Joseph Durham, Esq., in the chair.

Before proceeding to the electric light experiments we may refer to the specimens submitted to the attention of the society. Regarding the specimens spoken of by Mr. Shadbolt, it is unnecessary to say much beyond mentioning the fact that they were unquestionably the very worst on which to try a lens defining accurately on a mathematical plane, and a very crucial test for a lens possessing what is termed depth of focus; one being a view in a cemetery in which the lens was focussed sharply on a tombstone at no great distance; the inscription on this was very perfect definition, whilst all the tombstones from a few feet behind it were out of focus. The other picture was an architectural subject, but the focus was upon the corner of a building, so that its two receding sides rapidly ran out of focus. Mr. Bedford's pictures, with the same lens, were prints 11 in. by 9 in. of Ely Cathedral; one interior and one outside view, and were fine specimens of Mr. Bedford's skilful manipulation and judicious management. The focus of the lens was $12\frac{2}{3}$ inches, intended for pictures $8\frac{1}{2}$ in. by $6\frac{1}{2}$; the full aperture giving the interior in five minutes with a bad yellow light, is, we believe, $\frac{9}{10}$ in. In stating that the pictures were 11 in. by 9 in., it must not be understood that there was perfect definition over that space: the lens is intended simply for a whole plate, and does its work well over that amount of surface, giving satisfactory pictorial definition; beyond that space there was, of course, a gradual loss of definition and illumination. The well-known characteristics of the orthoscopic lens were sensibly apparent beyond the space the lens was intended to cover, and the marginal lines were curved outwards; this was, however, by Mr. Bedford's skilful management, reduced to a minimum over the more important parts of the picture. The work was, doubtless, excellent, both of the optician and the photographer; the marginal faults to which we have referred being inherent in that form of the lens, and not due to any imperfection in its manufacture. We have said more than we should have done on an apparently trivial subject, because we believe much misunderstanding and angry correspondence had arisen in connection with it.

In the course of the evening Mr. Sutton showed the first panoramic lens and camera made by Mr. Ross, together with the first negative taken with it. Various essential improvements had been effected upon those he had had made before, and he had every reason to believe most satisfactory results would be obtained. The negative was taken, we understand, on a tannin dry plate, and was exposed a minute-and-a-half. The definition and detail appeared very perfect. The view was taken from the roof of the laboratory at King's College, and included about an angle of 95°.

* Resumed from our last.

Mr. HEATH having read his paper descriptive of Professor Way's electric light (see p. 279), proceeded to show the difference in actinic character between the light thus obtained by means of the stream of mercury and that given by the carbon points in a Duboseq's lamp, which had been lent by Professor Farraday for the purpose, testing both by direct printing, and the mercury light by means of developed prints as we explained last week. The cost per hour, he understood, of charging the batteries, was about two shillings; and as a large number of printing frames might be hung round one lamp, the cost of printing need not be very heavy.

Mr. HUGHES having made his enlarging experiments,

Mr. MALONE referred to the former experiments of himself and others with the electric light. Interesting as the subject doubtless was, he did not think the experiments they had seen were sufficiently conclusive. He should have preferred to print a negative he had brought with him, which was the same as that he had before tried with the Duboscq lamp, and all the conditions regarding which he had noted carefully for comparison. The paper ought also to have been hung nearer to the light in both cases. He was not at all sure to what extent the glass shade over the mercury light acted as a reflector and gave it an advantage. These and other circumstances prevented the experiments from being of that comparative nature which was desirable, and, in his opinion, placed the carbon lamp at a disadvantage. He would therefore ask members to suspend their judgment. Regarding the question of cost it appeared that the estimate he had before given as an approximation, was not very different to that now arrived at. He had stated that the cost of charging the batteries was about ten shillings, and as they lasted four or five hours the result was the same as now stated, notwithstanding that at that time Mr. Heath endeavoured to throw cold water upon the idea as expensive and impracticable. These figures were not at all conclusive or reliable; the truth was, no one knew exactly the cost without more experiments, and more careful calculation than had yet been made. Having the utmost familiarity with the subject, and every facility, he was engaged at the present time on some more conclusive calculations to determine the cost. He was not at all sure that the mercury lamp would prove the best, and in comparing it with a Duboscq lamp, they should bear in mind that there was now an improved form of lamp with the carbon points, that of M. Serrin. The mercury might also prove dangerous to health. He knew one gentleman who having been experimenting with the Way lamp, suffered in health next day from its effects.*

Mr. HEATH was not there to recommend that lamp to photographers as best for their purpose, but rather as the exponent of its characteristics, as he knew something of it and its inventor. In his statements regarding its superior actinic character, he had simply quoted Dr. Gladstone, but he thought there could be no doubt of that fact. Regarding the trial referred to, the lamp was quite at Mr. Malone's service for the purpose when the proceedings were concluded. As to the glass over the mercury light acting as a reflector, he thought it unquestionably acted much more certainly in absorbing and dispersing light.

Mr. MALONE thought there would be both reflection and refraction. In any case the experiments were not comparable. He felt it his duty to make these remarks, otherwise he might be charged with having by his silence endorsed the conclusions put forth.

Mr. HEATH thought Mr. Malone need be under no apprehension about his silence in that room being misappreciated or misconstrued. Regarding the comparative nature of the experiments, they were not intended as comparative. The idea had just occurred to him that day, to ask Professor Faraday to lend the Duboscq lamp to give additional interest to the experiments. It had just been named to him in regard to this lamp, which had only recently returned from Paris, that M. Duboscq had admitted that there was no comparison between the amount of actinism in this lamp and his own, as illustrated by their respective spectra.

Mr. MALONE was glad to hear it. Did he refer to the length of the actinic part of the spectrum, or to intensity and rapidity of action?

We understood the answer to be that intensity was meant.

Mr. MALONE remarked, that it might be interesting to state that nothing gave a better actinic light for a short time than the burning of phosphorous in a jar of oxygen.

Mr. HIGHLY remarked that Mr. Serrin's lamp was no improvement on Duboscq's as regarded quality of light; the only difference was in a mechanical arrangement to keep up continuity, which in Duboscq's required to be done by an assistant.

Mr. HUGHES called attention to the solar camera, and explained how the excess of diffused light from various sources had prevented the experiments in enlarging, just attempted, not entirely satisfactory. The conditions also were so different in the use of solar light at an infinite distance and a source of light close to the instrument, that to succeed in enlarging by artificial light would require all the appliances being re-arranged to suit the conditions. The importance of facilities for rendering them independent of solar light for enlarging purposes could not be overrated in a climate like ours, where the meteorological conditions were so variable and uncertain. He regretted that time and opportunity had been wanting to secure the conditions of success that evening with the solar camera, as he felt convinced that this instrument had not received that attention its importance demanded; he did not believe that for the production of life-size portraits there were any other appliances in existence that could compare with it, and he spoke advisedly in saying so.

Mr. SHADBOLT had long waited for this opportunity, and now could not allow it to pass without publicly protesting that with such an instrument it was impossible to produce a sharp image from any negative. The condensing lens was non-achromatic, and a blurred image must result from its use. It was moreover placed in the worst possible position to produce good results. It should be—

Mr. HUGHES explained that at that moment it had just been placed there without intention, and was not in the position used for working.

Mr. SHADBOLT thought it was placed as when in use. However, the focus of the condenser, instead of being on the front lens, as recommended, ought to be on a point somewhere between the front and back lens of the copying combination. The subject was too long for discussion then, but he threw down the glove, and hoped Mr. Sutton would take it up.

Mr. SUTTON simply denied the accuracy of every one of Mr. Shadbolt's statements. He had given the subject much study, and knew of what he spoke. The condenser need not be achromatic; and its focus was in the right place. In short, without attempting to go into the subject at that hour of the night, he would content himself by saying he denied every statement Mr. Shadbolt had made. He was wrong altogether in the whole question.

After a few further remarks the proceedings terminated.

NEWCASTLE PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Friday evening, the 7th instant, in the Tower, New Bridge Street, Mr. G. C. WARREN, one of the vice-presidents in the chair.

After the preliminary proceedings

The CHAIRMAN called attention to a circular received by the Secretary from the Manchester Society, and concluded by expressing a hope that not a few of the members would contribute. He then pointed to the several specimen prints from the negatives obtained by the photogen, as exhibited at the last meeting of the Society, and referred to the remarks made by the editors of the photographic journals, to whom prints had been sent, all of whom coincided with the opinion expressed by the Experimental Committee.

Mr. LAWS read his paper on "Transparencies." (See p. 280.)

After an animated discussion, Mr. WARREN gave a short description of the various methods of intensifying negatives, and a model mode of transferring the negative film from glass to paper and other substances.

A discussion ensued.

Several members at a recent meeting having complained of the collodion film splitting from the glass whilst the negative is being dried, Mr. Warren suggested to the meeting a plan he had successfully adopted in such cases. Should the film have the least tendency to split he immediately flooded the plate with alcohol, this driving the water out of the film permitting the varnish to be poured on; the plate being in a moist state, the varnish occasionally dries dead, but this is of no consequence. By this means he had saved many negatives that

* We may remark that the gentleman referred to was Mr. Bedford, who felt unwell the day after his printing experiments with one of these lamps. It is but fair to add, however, that Mr Bedford explained to us that the lamp was confessedly an imperfect one, and out of order, the escape of mercurial vapour being an accident rather than a necessity of the apparatus.—ED.

otherwise, owing to the bad quality of the collodion, would have been entirely destroyed.

After the usual votes of thanks the meeting adjourned till the first Friday in July, when it is proposed to take into consideratien the propriety of adjourning the meetings during the summer months as is usual with other societies.

Mr. North has promised to read a paper at the next meeting on "The Construction of Glass Houses with especial reference to the Arrangement of Light."

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 11*th June*, 1861.

The continual suggestions of new formulæ, new methods, and new processes, implies a certain amount of imperfection in the best, even, of those at present adopted. It is not improbable that this chronic dissatisfaction will lead to a complete revolution in our material and *modus operandi*. Why collodion should be so capricious as it shows itself to be in so many operator's hands I cannot divine. Seeing that many photographers, not remarkable for any superiority in genius, plod on year after year in the same routine, without varying or abating one jot of the zeal or success. Failure and dissatisfaction I suspect, proceeds, in very many cases, from over-refinement; from expecting too much, nay everything, from the collodion, or the nitrate bath, or the toning, when, after all, the secret of success lies in none of these exclusively, but in tact and judgment in the right employment of them. I am led to these remarks by the contemplation of a marvellous specimen of photographic portraiture, a portrait of Lord Brougham, by Mr. Mayall, which is the admiration of our connoiseurs, and would seem to realize all that can be expected of the photographic art, and at once silence all the discontent and dissatisfaction expressed at the imperfection of the means. With such a result before us as this picture presents, complaints against collodion, &c., would indeed seem idle; for it is difficult to conceive how any finer result can be arrived at, whatever may be the future improvement in material or appliances.

Both M. Van Monckhoven and the Abbé Desprats, to whom we already owe so much, have returned to the much-vexed questions of collodion and developing agents, with what results the sequel will show. From an intimation, however, recently set forth in your journal, it would seem likely that collodion will be superceded, and with it the vexed nitrate bath—let us hope the news is not too good to be true.

Messrs. Recolz and Fontenay have produced a new alloy which is applicable to the production of coins as well as to many important industrial purposes. It consists of one-third silver united with 25 to 30 per cent. of nickel, and from 37 to 42 of copper. Its preparation is a true chemical *tour de force*, for the elements of which it is composed, if merely melted together, yield a product void of homogeneity—an imperfect mixture, rather than a combination. To make it combine intimately, Messrs. Recolz and Fontenay have recourse to certain fluxes, which they do not specify, and also to phosphorus. The alloy thus obtained is at first very brittle; it cannot be fashioned under the hammer, nor drawn into wire, and is altogether deficient in those properties most required in working metals. But it is sufficient to remove the phosphorus if the compound be re-heated, after which the alloy perfectly resembles a simple metal, and presents in a very high degree the qualities to which the precious metals owe their superiority. It resembles platinum and silver of $\frac{800}{1000}$ in colour: it takes a very brilliant polish. Its tenacity and hardness are extreme. It is ductile, malleable, and very difficult of fusion; very sonorous, unalterable in the air, and attacked only by the most energetic reagents. It has no odour, and its specific gravity is but little inferior to that of silver. It is easy to estimate the important part such an alloy is calculated to play in the industrial arts, and especially in the silversmith's art—in, to a great extent, replacing silver, of which its price is 40 per cent. less, and as its hardness gives it a marked superiority. Again, articles which are merely silvered or gilt have, it is true, a great advantage in their low price; but they quickly deteriorate, and can be re-silvered or regilt only a very few times, after which they must be replaced by new ones, and, in the long run, entail such an outlay as to confirm the old adage, that "the cheapest is the dearest in the end." Moreover, Messrs. Recolz and Fontenay propose to substitute their new silver alloy in coining pieces of money of less value than five francs. Under this point of view, they say, the alloy presents the following advantages:—"Its preparation and application require a plant and special precautions which render counterfeiting extremely difficult. The nature of its constituent elements is such that the cost of the necessary refinings to bring it to a high standard deprives it of any advantage in exportation. Its hardness, much greater than that of silver, which reduces the necessity now experienced for recoinage, as the coins would be very slow to wear away.

A Parisian architect has made a very ingenious suggestion for the cure of many of the evils inflicted upon citizens by the present mode of arranging chimneys, and more especially to remove the present architectural eye-sores caused by uncouth and hideous chimney-pots. He proposes to construct at the roof of an edifice a smoke chamber furnished with a central orifice, to which any desired architectural form may be given. Into this chamber all the chimneys of the building are to be conducted, and there discharge their smoke, putting an end at once to the nuisance of bad draughts, smoky chimneys, &c.

The heat of the smoke-chamber may be economised.

The approaching hot season renders any suggestion for the cure of hydrophobia interesting. Dr. Rodet, of Lyons, who has for a long time devoted his time to researches for an antidote to various animal poisons, as in farcy, glanders, syphilitic virus, &c., employs topically, a liquid containing perchloride of iron as a basis, which he has found very efficacious, as it destroys the virus even if applied two hours after the bite of the rabid animal, and it seems not improbable that its action would be effectual even if applied four or six hours after the wound is inflicted.

M. Th. du Moncel has made some interesting researches on the transmission of electricity through the earth. He states that upon connecting, by means of an isolated wire, two iron plates buried in soils differing in constitution, either with respect to humidity, or in physical or chemical condition, a telluric current results, which is much more energetic when the difference of humidity in the soil surrounding the electro-positive plate is greatest. This shows that the intervening current in electric transmissions through the telegraphic circuits, materially alters the conditions of resistance of these circuits, and also the conditions of constancy in the currents transmitted, according to the manner in which the pile is placed in relation with the buried plates. When the telluric current travels in the same direction as the current of the pile, the current of polarization due to the polarization of the buried plates is destroyed, and consequently the resistance of the circuit is found to be diminished at the same time that the intensity of the current acquires most constancy. In the opposite case, the telluric current is added to the current of polarization, and the injurious effects due to this latter current are found to be augmented. The result, therefore, is, an augmentation in the resistance of the circuit which continues augmenting with the duration of the closing of the current, and which is much greater relatively as the length of the circuit is more considerable. As a practical conclusion of these effects, M. du Moncel concludes that the choice of the pole of the pile of the line which must be put in connection with the earth at the station of departure in telegraphy, is not a matter of indifference, and must be determined by the direction of the telluric current which pervades the line. If this current proceeds from the station of departure to the corresponding station, the negative pole of the pile must be connected with the earth, in the opposite case, it must be the positive pole.

PROFESSIONAL PHOTOGRAPHY IN THE MAURITIUS.

"Photographers of England,
Who live at home at ease,
How little do you guess the bores
We have across the seas."

MR. EDITOR,—I recollect reading some time since in your journal a description of a scene in a photographer's studio at home, I think your readers may possibly be amused with a colonial one. In England the photographer well established knows little of the difficulties of the "delightful art" as carried on here with even pecuniary success, and the shifts one is compelled to resort to.

The ship has not arrived with your last order, or having arrived, you find your chemicals decomposed by the heat of the hold, your ether evaporated, your acids (having been carried on deck at your risk as per bill of lading) thrown overboard on the passage. You go to a chemist, who in consideration of ten dollars (£2) per lb. *obliges* you with a small quantity of ether. You try it and find it sp. gr. ·870 and have to set to work to wash and rectify it. The same with your alcohol. Your nitrate of silver is all done, and none to be bought; you procure nitric acid at five shillings a pound, and with sterling silver make it in a pipkin. Although a cotton growing country, you can get no cotton wool, sulphuric acid is five shillings a pound, and you are at a standstill for pyroxyline. At length you make your gun cotton with darning cotton (and a good shift too) and you are finally *en train*. Having secured an *atelier* at £12 per month: and as you fancy yourself a sufficiently good linguist to meet conversational business exigencies, there are no further difficulties, and you go a-head.

SCENE 1st.—Photographers Studio at Mauritius, Thermometer 96°.—Enter two young ladies (brown) in white dresses.

"Bon jour, Monsieur, moi besoin vous tirer mon portrait." (Good morning sir. I want you to take my portrait).

"Certainly, but I am sorry to say I shall not be able in white dresses to give you satisfaction; if you will come in dark or coloured dresses I shall have much pleasure."

"How much must I pay for that size?"*

"Five dollars."

"Oh! that's very dear; I am not able to pay so much as that. I will give you twenty-five francs" (10s.).

"Sorry to say I cannot," &c. &c.

"Well, I will give your price if you will put it into a pretty box the same as that."

Agreed, the ladies return in dark dresses, the portraits are taken and shown.

"Oh! I am not so ugly as that. Look how large the mouth is, and the face quite black, and little specks in my eyes. Mon Dieu! look at the hair, its all white," (she has not spared the cocoa-nut oil to make her wool lie smooth, and of course the light is thrown off in a patch on the front of the head). Finally, by means of the pencil I make the picture no longer a photograph, they retire satisfied.

Next we have a group of young gentlemen from the garrison, who at once monopolise the *salon*.

"Let me—ah!—see your pictures—ah;—What's the pwice of this—ah!"

"Ten shillings."

"Monstwos—whoy, befaw we left; Jenkins of ours had himself taken at some fellahs in Wegent Street for a shilling, spwendid picture, in full uniform, couwdn't think of giving such absurd pwices as yours. Come Bob, lets go and get some bittah beah.

Exeunt having made an impression on those waiting, and causing them to think you were imposing on them.

Then a lady with a child.

"I wish you to take my little boy, I have promised to send his picture home to his grandmamma; I should like you to take him standing to show how tall he is, and, that the picture may look natural, playing with his dog, and his ayah (nurse) standing behind him.

Here is a complication of impossibilities, and yet you are expected to make a good picture; the child is fifteen months old, can just stand, is very fair with light eyes, and has a light blue dress on. The dog is a white poodle, and the nurse is a black Indian woman, with a white muslin wrapper thrown round her, and over her head, and looking as if she fancied you were going to shoot her from the mouth of the camera; the mother and two or three friends insisting on looking on, because (they say) the child will not be quiet unless they are there; however, by good luck, patience, and perseverance, you get a picture. Such are a few of the scenes taking place every day, not at all exaggerated.

The coloured population you cannot please unless you make them fifty per cent lighter than they really are; the English, who have friends in England, have pictures sent them which there cost a few shillings; and, forgetting the difficulties you labour under, and the comparatively few sitters you have, they imagine your prices exorbitant. "Why we have only to sit a few seconds, and you can earn so much." Another will come in and want views of the country: your negatives have to be taken under great disadvantages, in a country I admit abounding in most romantic scenery, but without any accommodation, and to move about much is ruin both to your pocket and your temper; besides, every person has his or her particularly beautiful view that you must take to make the series complete. I would advise any person contemplating going abroad to think twice 'ere they do it—for my own part, were I not fixed, and could get out of it, I would prefer being a bricklayer's labourer to

A CREOLE PHOTOGRAPHER.

Mauritius, August, 1860.

* It is not necessary to give the French patois of our correspondent's fair (?) interlocutors.

Photographic Notes and Queries.

STAINS AND STREAKS.

SIR,—A long paper has been read to prove that stray light in the dark room is the cause of streaks on the sensitized plate. A long discussion followed doubting the fact; and a leader winds up by denying the assumption. Allow me to put in a streak of advice. Let a ray of light into your dark room, or if you like, leave the door ajar, and notice the effect. Five minutes devoted to this experiment would settle the point to the satisfaction of all. MUS.

Mous, June 1st.

[It is not doubted that diffused light in the dark room may, under certain conditions, be a cause of streaks: we know it to be so. It is only denied that it is the universal cause, or even a common one. Actinic light has no business in a dark room; but when present, streaks are not the most usual sign it gives of its presence.—ED.]

PHOTOGRAPHS ON IVORY.—We have recently had our attention called to some photographs on ivory by Mr. Perry, who, as will be seen from our advertisement columns, has just removed into Piccadilly. The process is a secret one known only to Mr. Perry, the inventor, who, however, expresses the fullest assurance of its permanence. They are coloured with much care, and have all the delicato and transparent effect which generally characterizes ivory miniatures. We have not seen any uncoloured copies, and cannot therefore speak of their photographic merits.

Talk in the Studio.

The Art Season is not, so far, at all favourable in its aspect as compared with last year's. The sales being generally few both at the sale-rooms and the exhibitions.

Leslie's Paintings.—The proposed exhibition of these works at the house of the Society of Arts has been abandoned, so many of their proprietors appearing reluctant to contribute to the collection.

The Society of Arts Conversazione.—Some fine transparent enlarged photographs, by the oxyhydrogen light, were exhibited on this occasion. A still more interesting meeting took place at South Kensington on the 1st of June.

Photographic Cherubs.—We were much amused by a photograph recently executed by Mr. A. H. Wall, of Old Bond Street, in which a number of heads, borne, cherub-like, on wings, were grouped against a back-ground of sky and cloud. The familiar features of Paul Bedford, with his hat cocked rakishly aside, seemed peculiarly ludicrous when associated with his angelic appendages; and Toole, the ever-funny yet never unnatural Toole, seemed soaring away as if legs were things undreamt-of in his philosophy. Rosina Wright, *without her legs*, was hard to be conceived, and we could not regard her wings as compensation for a loss which would be quite a national calamity. Pretty Kate Carson as an angel was not half so charming as she is in all the charms of womanhood; and sprightly little Marie Wilton seemed to think her position one demanding very solemn thought. A dozen of our popular actors and actresses, in short, are thus grouped; and the effect is certainly provocative of laughter. Of course, the method adopted is similar to that by which the large-headed, small-bodied, portraits now in the shop windows are produced, viz., printing the heads without the bodies, and painting in the wings with Indian ink.

Stereographs of Dutch Scenery.—We have received from a correspondent at Amsterdam a parcel of very interesting stereographs, consisting chiefly of scenes in and about Amsterdam and Haarlem. They are the first Dutch photographs which we remember to have seen, and are full of interest; the quaint style of the buildings, so like those still remaining of the time of Queen Anne in this country, and the prevalence of the universal canal, add much to the value of the pictures. For the most part the photography is very good; vigorous, yet full of detail. A few are by the collodio-albumen process, as given by Mr. Sidebotham in our pages some time ago; but the majority are by the hot water process as suggested by Dr. Ryley, and subsequently by Mr. Parry, and are sufficient to vouch highly for the valuable results obtainable by that process.

To Correspondents.

Sol.—We are glad that our suggestion has enabled you to apply a remedy; we felt convinced that the vulcanized india-rubber was the cause of the annoyance.

Exeter.—The size and shape of the mirror of the solar camera are, we suppose, those conceived to be by the inventor the most convenient: it is quite possible that an improvement might be effected. The focus of the condenser is recommended by the inventor to be kept upon the front lens; but, as we have before said, we should conceive that it ought to be on the same point as a central stop between the lenses. Of course the movement of the copying lens by means of the rack and pinion will alter its relation to the focus of the condenser, but there is an arrangement for regulating that, which, we presume, should be done the last thing.

Mr. Polman, of the Hague, has been recommended the use of some apparatus to prevent photographers breathing the fumes of ether and other deleterious chemicals whilst operating. We have not heard of such apparatus. We shall be glad if any of our correspondents can give information on the subject. We do not know of any method of obtaining Rouch's collodion in Holland, except by sending for it to this country direct. We are glad to hear of your successful practice of Bartholomew's, or Hannaford's modification of the Fothergill process, and of the aid you derive from the News.

X. Y.—Do not tone so deeply, a little warmer tone will be much more pleasing.

M. J.—We prefer cyanide for fixing positives, and hyposulphite of soda for fixing negatives. The surface of the image is generally a little browner when fixed with the latter, and this is as much an advantage for a negative as it is a disadvantage for a positive.

L.—You can measure the height of distant objects by the aid of photography approximately, if you know the distance you are from the object, and it be on tolerably level ground. It is a simple rule of proportion. Measure the height of the image produced, and then calculate, as the length of focus of the lens is to the image produced, so will be the distance from the camera to the height of the object required. Thus if with your lens of 4½ inches focus, you get an image of a building 2¼ inches high, at a distance of a hundred yards; the height of the building would be fifty yards, fifty bearing the same relation to a hundred which 2¼ does to 4½. Bear in mind this will be only a tolerably near approximation, unless the ground be quite level, and you calculate the exact focus of the lens for the distance.

Philip.—Transparencies on glass generally exhibit much greater delicacy and detail, than proofs from the same negatives on paper.

Amsterdam.—We are much gratified by your letter, and the stereographs. Independent of the merit of many of the pictures, the subjects are full of interest, and are to us entirely new. There are two or three suggestions we may make, which will make your work still better. Although you have largely avoided the faults common to dry processes, yet a little more exposure would still be beneficial in many instances. But the chief point to which we would call your attention is the fact that whilst many of the slides have more of one side of the picture in one half, and more of the other side on the other half, it is generally in the wrong directon. Thus if the amount of subject be not exactly the same in each half, the variation should be that the right picture should give a little more on the right side, and the left picture a little more on the left half, just as would really be seen by each eye separately. In yours unfortunately the converse is true; you have a little more of the left side of the subject which would be seen by the left eye mounted on that end of the slide which is seen by the right eye, and *vice versâ*. Read Mr. Shadbolt's remarks on the subject at a recent North London meeting. The stereoscopic effect of your pictures will be materially enhanced by attention to this matter. Your pictures being sent as a present rather than for criticism, we have felt some hesitation in referring to any points in which they might be improved; but we feel assured that you would rather be informed of a point whereby you may materially improve them than not. We thank you for the kind letter and present of so many interesting slides.

Seaside.—The patent starch, in powder, and colourless, that is without the addition of blue, is the substance we have found best as a paste for mounting photographs. To make the paste, take a teaspoonful of the starch powder and moisten with the smallest possible quantity of water, about a teaspoonful, then pour on boiling water, stirring rapidly, until the paste is of the consistency of a jelly. We have made it in a marmalade jar, and a tea spoonful of starch will make a jarful of paste. Its keeping properties much depend on temperature. In warm weather not more than two or three days. It is best used fresh.

Photo.—Use a good bromo-iodized collodion; develop with iron and work in a good light for instantaneous effects. The best lenses you can get, and the largest stop with which you can get definition, are suitable for the purpose. The lenses of various good makers will answer; we have more than once mentioned those we use ourselves and find very rapid.

E. A.—We cannot undertake to say which is the best dark tent, inasmuch as we have not tried all. We recently described Smart's, which appears very good indeed. We have before described Leake's, which is cheap and useful for small work such as stereo pictures, and we have known 10 by 8 pictures worked in them. We shall shortly describe a very excellent one just making by Mr. Rouch, and also some others. By all means tone and fix separately, using the alkaline gold toning process.

M. B. Joye.—We will insert your letter next week, as interesting to those concerned. See article on the use of gallic acid in connection with Fothergill plates. We do not see that you will gain anything by changing your collodion. We do not recognize the spots you speak of, nor can we without seeing suggest cause or remedy.

N.—There is no doubt that the liquefaction is spontaneous. In fact such a result could scarcely fail to occur at some time, as it is only in virtue of its deliquescent character that chloride of calcium keeps paper dry by absorbing its moisture. Super-saturation, must necessarily only be a question of time. It may be desirable, as you suggest, that the matter should be better known. Will you write a statement of the case, or shall we make an abstract of your letters?

F. E. G.—We have been much engaged, and also from home. We will send in a few days.

Despair.—We see no reason whatever, why you should despair. Each one of the numerous specimens sent, possess some good points, and if we are not mistaken we have seen some better prints from some of the same negatives, in a specimen case. We have not time or space to enter into minute criticism this week; but may do so another time. The chief fault is too much light right in front of your sitter, which flattens prominent features; a little under-exposure seems to prevail also. Observe carefully the best works of the best artists, and see in what they differ from your own. We think you will have ability enough to improve considerably still.

G. Smith.—You mistake the meaning of the term; there are no signs of solarization about your picture. Solarization is always most manifest in the parts of a picture which are most illuminated, such as the sky; and results in thinness of image. Your sky appears very dense. The foliage exhibits signs of having moved very much; but if, as you state, there was no wind, it is the result of very imperfect focus. There is no part sharp, and if it be not the result of very imperfect focussing, it is a very bad lens. The negative is also under-exposed.

William Dodgson.—We are obliged by your communication, which shall receive our attention.

J. A. Hurd.—You are in error in your estimate of the relation of specific gravity in alcohol and what is termed "proof." Proof spirit has a sp. gr. of ·920, or a fraction less, but you cannot arrive at the sp. gr. of spirit a given strength over proof, say 60, by deducting that from 920, because the figures refer to two distinct things. Spirit 60 over-proof has a sp. gr. of nearly 830; spirit of 63 over-proof has a sp. gr. of nearly 825; and that 65 over-proof a sp. gr. of about ·820. We are not now speaking by the card, as to fractions, but you will get the figures from Syke's hydrometer tables. The strengths we have named are easily obtained, and are near enough for practical purposes. 2. We have never tried the spirit you name; but it is quite possible that it would answer the purpose perfectly. By redistillation over quick lime you can obtain a sp. gr. of ·805 from spirit 60 over-proof. We believe Mr. Hardwich recommends redistillation from sulphuric acid. 3. We shall describe the contrivance you name, shortly. 4. The darkness in the hands and features to which you refer, may proceed from various causes, such as bad lighting, under-exposure, or a collodion wanting in intensity. We presume, from your remarks, you are speaking of positives on glass. If you are, the formula given is altogether an error. You may use the collodion named without any dilution with alcohol and ether. It is a common error with persons who have not worked the positive process to recommend a thin collodion.

An article on "Depth of Focus," and letters on the same subject, together with several other articles and letters are in type, but stand over for want of space.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 146.—*June* 21, 1861.

DEPTH OF FOCUS: WHAT IS IT?

It is a trite saying, that almost all controversies arise out of the erroneous use, or misconception, of terms. An incidental discussion, which arose at the Photographic Society the other evening, on the subject of what is termed "depth of focus," and which was but the fresh "cropping out" of an old dispute, certainly seems to come under that class of controversies.

Mr. Shadbolt declares the phrase an absurdity, and the thing an impossibility; and

> "What 's impossible cannot be,
> And never, never comes to pass."

Mr. Sutton affirms that the thing does exist, and that without it we could have no presentable picture. He not only affirms that the thing exists, but that there are two distinct forms of it, one of which is legitimate and desirable, and the other the result of imperfection and error in the manufacture of lenses; that a bad lens might give depth of focus with full aperture, but that a good one would give depth of focus by using a sufficiently small aperture.

Now when Mr. Shadbolt exclaims that it is utterly impossible to get two objects in different planes in perfect focus at the same time, he simply states what no one, using the word focus in the same absolute sense in which he uses it, can for a moment deny; but tying the word down to a use a little more absolute, we may further affirm that it is impossible to obtain a perfect focus at all. It is clear, then, that we must use the word relatively. Absolute focus being impossible, the question resolves itself into one of sufficient definition. That a lens the most scientifically perfect, giving microscopic definition to objects on a mathematical plane, will give all other objects more or less out of focus, and that in a most unmistakable manner, there can be no doubt; but whether such a lens is, after all, the best for the purpose of a photographer, is open to considerable question.

The word focus having an absolute sense as referring to the circle of least confusion, or the point at which the rays cross, exception may possibly be taken to the term "depth of focus" as it may be said to be referring to the depth of that which, strictly speaking, cannot have depth. It is possible that the word "definition," as having a more relative meaning might, with advantage, be substituted for the word "focus," and the phrase "depth of definition" be used to describe the quality in discussion. The phrase would imply not depth of perfect focus, since that cannot exist, but such amount of definition through a given space as shall be necessary to meet the exigencies of pictorial art.

Mr. Malone rightly remarks, that we must look at the question practically, and in relation to the necessities of photography, and these necessities are, nine times out of ten, pictorial effect. Mr. Shadbolt thinks he is true to art as well as science when he states that he requires a lens to approximate to the human eye, which can only have objects in one plane in focus at the same time. But the human eye will, in the fraction of a minute, adjust itself to every plane of view before it, and produce on the mind the effect of perceiving the whole at once. The painter who sits down to paint a landscape, would never dream of fixing his eye in one focus and never altering it during the progress of his picture. His object is to get such a picture as the eye sees, as it constantly adjusts itself over the landscape before it. It is true he does not attempt to paint every object with equal perfectness of definition; he does not see every object so, however he may vary the focus of his eye. There is an increasing veil of atmosphere between him and objects at each gradation of distance, which, whilst it does not alter or even blur forms, prevents them from being "made out" with the minuteness of foreground objects. All the objects he can define perfectly with the eye, he does not necessarily define as perfectly in his picture, because some require to be subordinated. All foreground objects, and especially those intended to concentrate the interest, will be more crisply defined, more vivid in contrast of light and shadow, and more brilliant in colour than the rest. Each receding plane of distance will be less sharply defined, less marked in contrast of chiaroscuro and colour, until, in the extreme distance, details and contrasts are almost entirely lost. But this absence of definition is nowhere of the blurred character which is presented by objects entirely out of focus, and is produced by a lens as perfectly corrected as possible, when used without a stop.

There can be no doubt that the exigencies of pictorial art demand the presence, to a certain extent, of this quality, which has been called "depth of focus." A portrait with the eyes sharp, and the nose, ears, and various locks of hair little more than indistinct blurs, is something very hideous; and yet we have seen this where a lens of short focus, defining very accurately objects on a mathematical plane and nothing more, has been used. A landscape with a few objects crisp and well defined, and the rest a mass of indistinctness in which neither form nor texture are indicated, is simply intolerable and worthless. Some depth of definition then is absolutely necessary to pictorial effect. A portrait lens must have sufficient depth to give, with judicious management, all parts of the body with something like satisfactory definition; all parts of the head should, at least, be fairly defined, so that when the focus is on the eyes, the nose and retiring locks of hair may not be perceptibly out. In a landscape much greater depth is necessary, and in view lenses always exists to a greater or less extent, and is also more readily obtainable by other means than in the case of portraiture.

There are several sources from whence this depth of definition may be obtained. It may sometimes be obtained from what is called a bad lens, that is, a lens imperfectly corrected for spherical and chromatic aberrations. If it be thus obtained it may, by rare accident, be in just the desirable ratio for artistic purposes; but it is more frequently at the entire expense of anything like defining power at all, and renders the lens comparatively worthless. In the ordinary view lens a certain amount of depth of definition necessarily does exist, from the simple fact that it is impossible to correct it entirely for spherical aberration, but the aim of the optician is always to correct it as perfectly as he can. Depth can also be obtained in the best corrected lenses as suggested by Mr. Sutton, by the use of small stops; by their use the rays of light are made, in crossing, to form a much more acute angle, so that definition over a greater depth of space is obtained. Depth of definition can always be obtained by retiring sufficiently far from the nearest object to be taken, so as to render the distance of all objects beyond, as nearly *nil* as possible, in relation to the length of focus of the lens.

As regards the last-mentioned method it is clearly out of the question to think of adopting it to any extent in portraiture, as it would involve the use in all cases of very long rooms, and of lenses of very long focus. And it is also frequently difficult, even in landscape work, to use it largely. The use of stops for the purpose is doubtless very legitimate, and often desirable. But even this has its limits, as the use of very small stops not only involves very considerable loss of light, but also materially diminishes the relief and boldness of the picture, giving it a flat and map-like effect; if, moreover, the aperture be reduced too much, we have not only these evils, but actually err on the other side, and obtain definition of nearly equal distinctness in foreground objects, and those perhaps miles away.

The use of bad lenses seems a thing unnecessary to discuss. No workman would willingly use a bad tool; and where this badness arises from incapacity or carelessness on the part of the maker, although it may now and then, just by accident, give a near approximation to desirable results, it cannot be relied on, and must be ignored as out of consideration. But there are good lenses which possess this defining power over a considerable depth, without losing in an appreciable degree the power of giving the best definition to objects more in focus. It is unnecessary to discuss, nor would it profit the majority of photographers to know, whether this quality is the result of over-correction for colour, or under-correction for spherical aberration, or both; or the result of a judicious antagonism of forces on the part of the skilful optician. But we think it important in the interest of those who, in practising photograpy, aim at producing pictures which shall possess definition over as great a depth as the artist would give it in his painting, to state that lenses with such defining powers exist. And that if the productions of those opticians who, in manufacturing their lenses, consider the work they are to perform, and who therefore give to a lens intended for such mechanical purposes as copying, a power to define as accurately as possible a mathematical plane and nothing more, but also give to lenses intended for the production of pictures having different planes of distance, sufficient depth of definition to do the work when judiciously managed, satisfactorily; if, we say, such lenses are to be stigmatized as bad, then we must confess our conviction that art-photographers will for many purposes decide to use such "bad" lenses: and, in the interests of art, we can but commend their decision. We may add our conviction, however, that the term "badness" is in such cases entirely a misnomer, and that such lenses can only be expected from the hands of the very best opticians.

INSTANTANEOUS PICTURES: STEREOGRAPHS BY MOONLIGHT, &c.

In our recent visit to the Birmingham exhibition we experienced that rare thing, a new sensation. Arrived at Aston Hall, accompanied by our good friend Mr. C. Jabez Hughes, we had, in obedience to the placarded invitation, "This way," traversed the "Arctic Regions in Winter," and the same scenes in their summer aspect, and having passed through the Stalactite caverns and some other unknown or unnoticed regions in our search for the photographic department, we found ourselves in a large hall in which, standing solitary and alone, were two handsome, circular stands of stereoscopes, exhibited, as we afterwards understood, by Mr. Breese of Birmingham.

We sauntered somewhat indifferently up to them, being in truth much more anxious to see a good display of solar camera pictures, which as yet we had looked in vain for. We had, however, scarcely fixed our eyes on the first stereoscope, when we were startled entirely out of our propriety by the exquisite picture before us. The scene we were familiar enough with, both in fact and in the stereoscope. It was a view of Fountain's Abbey; but instead of merely the picturesque old ruin, here we saw running water which really was water, bright, sparkling, transparent; we saw an exquisite sky with light delicate clouds, and the whole picture suffused with atmosphere in a degree we had never before seen in a photograph. Let us not be misunderstood: we are not disparaging the gems of Wilson and some others; but these were exquisitely printed transparencies from negatives equal to the best of Wilson's. When this fact is realized, our readers will understand something of the charm of the picture before us. "Come here," we quickly exclaimed to our companion, "here is something wonderfully beautiful!" "Nay, but come here," was the rejoinder, "nothing can surpass this!" Each picture we examined seemed but to awake new feelings of surprise, each being marked with some new feature of wonder or beauty.

A landscape view near Sydenham, with the Crystal Palace in the distance, was, perhaps, one of the most beautiful. Words fail us to describe the exquisite delicacy and ethereal charm of this picture. Those of our readers who remember Martin's picture of the Plains of Heaven, either in the original painting or the engraving, will recall the glorious white palace in the distance, so radiant with light that it seems to mingle with the effulgent atmosphere. Just such an effect is produced in the slide we refer to, the fairy-like structure so light and ariel, is yet so distinctly rendered against the still more distant and slightly-clouded sky. Stormy seas, under skies, with storm-driven clouds flying over them, most perfectly rendered, next met our attention. Setting suns, surrounded by clouds, the whole repeated by reflection in the water beneath, such as Wilson loves to depict. An instantaneous waterfall, in which the sparkling waters are crisp and clear as threads of silver; the "woolliness" which arises from moving water, where a prolonged exposure is necessary, being entirely absent. Scenes of still life, presenting the most delicate and exquisite gradations. A slide before us is a strikingly-beautiful subject of this kind: it consists of a simple but skilfully-arranged group of objects on a marble chimney-piece, in which there is but one colour, and that colour, to use a solecism, white; difference in surface or texture is almost the only source of variety. It consists of a parian statuette under a glass shade, a glass of water, a cut-glass bottle, and a cut-glass lustre, a chased silver flagon, and a pearl shell, arranged, as we have said on the white marble chimney-piece, and a looking glass for background. Here we have the white of parian, of cut glass, of water, of silver, of pearl, and of marble. A most unpromising photographic combination: but the result is startingly real and beautiful, and an admirable study of the influence and value of accidental and reflected lights.

If we had wondered and admired, as we examined the slides we have referred to, we fairly grew incredulous when we came to moonlit scenes, and at once began comparing notes as to the various possible ingenious "dodges" by which such illusions, as we deemed them to be, might be produced. There were three pictures rendering moonlight effects. One is a moonlit sea, with the play of the moonbeams on the water, so different from the flood of light thrown by the sun on a similar surface. Another is the moon itself in the midst of a mass of cumulose clouds, which are tipped with silver, and rendered more or less transparent throughout by the moon's light. The third is an interior with the figure of a lady looking out of the window, through which is seen a moonlit sky. The figure is, of course, little more than a silhouette, the edge of which is traced by a well-marked line of light. The white lace sleeve on the arm which rests upon a table underneath the window is well made out, as is also the polished surface of the table reflecting the moonlight.

That these effects of moonlight real and illusive as they seemed, were produced in some way by the aid of sunlight we felt little inclined to doubt, until on subsequently meeting Mr. Breese, and spending some pleasant hours in his company, he gave us his assurance that each view was really what it purported to be, without any trick, that the moonlit pictures were produced by moonlight only, and that they had required little more than instantaneous exposure.

Regarding the source of the extreme sensitiveness necessary in producing these pictures, Mr. Breese preserves his own secret, merely stating that it chiefly depends on a modification of the collodion he uses. A few particulars of his practice he placed at our disposal, and these will be interesting to our readers. He uses a bromo-iodized collodion, a mixture of the products of two well-known makers generally best suiting his purpose. He developes with iron, and intensifies with pyro-gallic acid and silver. He uses the silver bath, and the iron developer, with as little acid as he can to preserve cleanness in the negatives, rather looking to the conditions of harmonious relation amongst all his chemicals, than to a constant adherence to any given proportions. For intantaneous pictures he has abandoned mechanical contrivances for rapid uncovering and covering of the lens, trusting to the ready movement of his hands as more accurately carrying out the dictates of his judgment as to degree of rapidity.

The transparencies are all produced by means of wet collodion, either by camera printing or superposition, and we unhesitatingly state that the finest we have seen do not surpass them, nor in many cases equal them. They also, are developed by iron, intensified with pyro, and, sometimes toned with gold. In several cases they are printed from negatives, the sky being in one, and the landscape in another; but where this is done, the two negatives are taken in immediate succession so as to secure the same atmospheric and illuminating conditions for both. The junction in the transparencies is not perceptible.

We have not commented on Mr. Breese's instantaneous pictures of the crowded streets of Birmingham during Her Majesty's visit, and which received the royal commendation, because notwithstanding their excellence they have, perhaps, been equalled—we cannot say surpassed—by the productions of some others we have seen.

Before concluding we must refer to a question which will have arisen to the minds of most of our readers: "How is it we have not heard of these wonderful pictures before?" We can suggest but one answer. Mr. Breese is an amateur, producing his pictures for his own gratification, and that of his immediate friends; and that although a member of the Birmingham Society, he is not a talker, but, in common with many of our very best artists, finds expression in his works.

We must not omit to add a word regarding the stereoscopes manufactured by Messrs. Cutts Sutton, and Co., of Sheffield, which struck us as equal to the best we had met with. They were furnished with whole achromatic lenses of five inches focus, and produced an effect of magnitude and distance which was very fine.

THE SOLAR CAMERA.

We have some important information to communicate to those of our readers interested in the solar camera. In a recent article on the subject we referred to the doubtful validity of the patent, and to certain improvements desirable in its construction. Since that period, having given the subject some attention, we have ascertained that the patent, whether valid or worthless, no longer exists. The protection has been suffered to lapse, and the matter is now public property. Those of our readers who have felt the need of improvement in the instrument, may now produce the same instrument, or such modifications as they may choose, without any risk of infringing a patent. Competition is the general source of improvement, and we hope it will have its legitimate influence here.

We cannot but regret the serious loss which we conceive the matter must have been to the proprietor of the patent in this country; and can only suggest to him, as the best means now of retrieving any loss, that he will still undoubtedly have an opportunity of getting the start of all competitors in supplying an improved article at a reasonable price.

We shall shortly have a few words on the application of artificial light to such cameras, and the required modifications in optical and mechanical arrangements.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analylsis.

Fluoride of Silver (concluded).—Perhaps the most successful application of fluoride of silver to photographic purposes is due to Messrs. Spiller and Crookes' researches on the different methods of preserving the sensitiveness of collodion plates. In May, 1856, a paper on the above subject was published by these experimentalists, in which several new agents were proposed to effect this purpose. Processes were described in which the desired object was attained by the employment respectively of glycerine, nitrate of magnesia (first successfully used by them in 1854), the double nitrate of magnesia and ammonia, nitrate of manganese, nitrate of copper, nitrate of nickel, fluoride of silver, and the silico-fluoride of silver. The latter salts were used with the object of combining the silver salt necessary for the sensitiveness, and the deliquescent salt requisite for the preservation of moisture in one and the same compound. The two substances having these properties in the most striking degree being the fluoride and the silico-fluoride of silver, it was determined to put the idea to the test of experiment. They were prepared by dissolving freshly precipitated carbonate of silver in hydrofluoric and hydrofluosilicic acids respectively. Solutions of these salts (which are highly deliquescent) were then used in place of the ordinary nitrate bath for exciting the iodized collodion film. Plates so treated readily became coated with a layer of iodide of silver, which seemed quite as sensitive to light as if it had been prepared in the ordinary nitrate bath; and they had, moreover, the property of retaining a moist surface. Unfortunately, however, it was found that the fluoride and silico-fluoride of silver in strong solution (such as was produced upon the surface of the wet plate by spontaneous evaporation) had the property, like the nitrate, of dissolving off the precipitate iodide of silver, destroying it by forming the small holes so well known in the ordinary collodion process. Meeting with this result, they determined to try their application in a more dilute form, after exciting the plate in a preliminary nitrate of silver bath; but by this mode of treatment, also, they were unsuccessful, being unable to preserve the sensitiveness by a quantity which was sufficient to exercise a destructive influence on the film. This difficulty, added to that experienced in the preparation of the fluoride in a neutral condition, any excess of hydrofluoric acid being objectionable on account of its property of etching glass, and, on the other hand, the slightest alkaline reaction rendering it extremely difficult to obtain clear pictures on development, deterred these gentlemen from pursuing the subject further in this direction.

Cyanides.—The only cyanide of any importance to photographers is the potassium compound of this radicle. *Cyanide of potassium* can be purchased at a very reasonable rate, but it is often very impure, and sometimes so much contaminated with other salts, that it is not fit to use. The pure salt may be prepared in many ways. One of the easiest is to heat ferrocyanide of potassium in the air until it is perfectly deprived of water, which may be known by its becoming quite white, and then placing it in a cast or wrought-iron vessel, it is gently ignited out of contact with the atmosphere until no more nitrogen goes off. There is thus formed a fused mixture of cyanide of potassium and carbide of iron. When this is cool it is to be broken up and the cyanide of potassium dissolved away from the insoluble carbide of iron by dissolving it in cold water, or, if the cyanide be required very pure, in hot alcohol. The solution (aqueous or alcoholic) after filtration is to be rapidly evaporated to dryness and the resulting crystalline mass quickly placed in well-stoppered bottles, and prepared for use. If too strong a heat be applied the cyanide of potassium is resolved into nitrogen and carbide of potassium, so that the residual mass evolves hydrogen in contact with water.

The way cyanide of potassium is usually formed on the large scale is by the process known as Liebig's process. This consists in mixing intimately 8 parts of ferrocyanide of potassium, dehydrated on an iron spoon until it is commencing to slightly decompose, with three parts of pure dry carbonate of potash. The mixture is then thrown into a crucible at a low red heat, and ignited very gently until samples taken out of the fused mixture from time to time with a glass rod no longer solidify to a brown or yellow, but to a white mass. The crucible is then taken out of the fire, the mixture stirred several times with the glass rod, and after leaving the heavier portion to subside, the transparent and colourless liquid is poured from the grey spongy mass into a hot porcelain dish. The residue in the crucible may still be rendered available by exhausting it with cold water, and heating the solution with sulphide of iron. Ferrocyanide of potassium is then reproduced, and after it has crystallized out sulphide of potassium remains in the mother liquor. The carbonate of potash used in this preparation must be quite free from sulphate, which would be reduced by the cyanide of potassium to the state of sulphide of potassium. An iron crucible is preferable to an earthen one, because the latter is penetrated by the mass, and imparts silicate of potash to it. A dull red heat must be uniformly maintained during the whole process. The cyanide of potassium thus obtained forms a white mass, free from granules of iron; its aqueous solution should be transparent and colourless. The ignition must not be continued till the evolution of gas ceases, otherwise the cyanide of potassium obtained will be grey; but the crucible must be removed from the fire as soon as a sample taken out on the glass rod appears white after cooling; moreover, the deposition of the iron should be favoured by a few slight blows upon the crucible, and the upper mass, which is purer than the other, separated after slow cooling from the lower portion by means of a sharp instrument.

If cyanide of potassium is made in either of the above ways with care, it will contain no impurities of any consequence. On the large scale, however, it is scarcely ever made with a sufficient degree of care to prevent impurities creeping in. The principal of these are carbonate of potash, sulphide of potassium, sulphate of potash, chloride of potassium, silicate of potash, ferrocyanide of potassium, sulphocyanide of potassium, cyanide of potash, and formiate of potash. The former of these impurities, *carbonate of potash*, remains behind when the cyanide is dissolved in hot alcohol. This residue can be tested for carbonate of potash, by its alkaline reaction, effervescence with acids, &c. If the impure cyanide is agitated with moderately diluted cold alcohol (78 per cent.), the carbonate of potash deliquesces and forms a fluid layer at the bottom. *Sulphide of potassium* may be detected by dissolving the cyanide in water, and adding acetate of lead to the solution; a dirty-coloured precipitate will be formed instead of a white one. *Sulphate of potash* is detected by adding an excess of hydrochloric acid and then a little chloride of barium to the solution, a white precipitate will be formed if a sulphate is present. *Chloride of potassium* is detected by igniting a small portion of it with twice its weight of nitre, and ten times its weight of carbonate of potash (both of course free from chlorine) then dissolving in water, supersaturating with nitric acid and adding nitrate of silver. A white precipitate shows the presence of chlorine. *Silicate of potash* is detected by supersaturating with hydrochloric acid, evaporating to dryness, and re-dissolving in water: silica will be left behind. *Ferrocyanide of potassium* is detected by mixing the solution with a small quantity of perchloride of iron, and then with hydrochloric acid: Prussian blue will be formed. Another test is to add sulphate of copper to the solution, the precipitate upon addition of hydrochloric acid will not turn white but reddish if ferrocyanide be present. If upon the addition of the iron salt and hydrochloric acid the solution turns red instead of blue, *sulphocyanide of potassium* will be present. *Cyanate of potash* is nearly always present; it can be detected by the evolution of carbonic acid upon the addition of hydrochloric acid. *Formiate of potash* is detected by the cyanide which contains it blackening on ignition.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Historical Painting.—If history painting may be judged as history writing is judged, that art is best adapted to the aim of of the historian which most faithfully records and preserves the features of the past for the contemplation of the future. If so, let me ask what art can do this as photography can? The sculptured relics and monumental remains of departed nations, the castles or encampments of a war-loving people, the mighty temples or cathedrals of a religious race, and every scrap of evidence remaining to us of the habits, customs, appearance, and general characteristics of the past, are, even now, so faithfully cherished by this new and beautiful art, that should all such perish from the face of the earth, we should have, in its productions, a more complete and unerring record of them all than could be found in written pages or on painted canvas. As to our own and coming times, our successors will see, as in a mirror, not only the very form and features of kings, ministers, generals, and the great in every department of scientific, literary, artistic, and political labour, but the battle fields of huge victories and defeats, the growth and importance of cities, the costumes and features of successive generations, and every scene and incident of historic interest, will be placed before those eyes unborn with such truth of detail, and perfectness of representation, that history and science will wonder at its prodigal wealth of material, and poor old Time feel that his greatest power has been torn from his enfeebled grasp. If the art that does so much for us is painting, poets grow eloquent, critics grow poetical, and politicians talk grandly of the vast importance of their mighty historian and teacher, art. If the art that does all this, and does it so much better than any other art, is photography, then poets pass it by as something too common-place for the notice of their muse, critics denounce it as arrogant and presumptious in its now lowly claims, and politicians are content that it should be cooped up in the lowest department of a great National Exhibition with "railway plant," "machines and tools," "agricultural implements," "ship's tackle," "musical instruments," &c. If historical *painting* is one of the noblest branches of art, why should an art of still more important historic value be thus degraded in the eyes of the world by a nation which claims intellectual equality with the most civilized, sensible, educated, and refined of its neighbours? All honour to the Photographic Society for the energy and labour they have brought to bear upon the wrong so obstinately and stupidly persisted in by Her Majesty's palpably prejudiced and illiberal Commissioners. I trust, at least, that all our photographic societies will be prepared to lend a strong and willing hand in whatever steps the parent Society may ultimately deem it wise to take for resenting or redressing this wrong, and the correction of this absurd blunder. Surely we are not altogether powerless, with so many lovers and practitioners of our art occupying lofty and influential positions. If we want an example or leader only, is there not that royal personage, that mighty monarch, Punch, who, speaking from his throne in Fleet Street, cries, with the loud emphasis of one having power, "Ho! there, none of that, *Fair play for photography*, ye coward loons; strike one of your own size, and not a little one, only a few years old. *Don't* you hit him again, he *has* some friends!" Heaven bless your handsome humps, King Punch, and let us hear your royal voice sound like a trumpet (tooity, tooity, who said a penny one?) once again!

Horizontal Line.—This is a line indicating the height of the horizon,* which in its turn indicates the height of the camera or spectator, the line of the horizon being always on a level with the latter's eye.† Thus a bird's-eye view is one

* The participle of the Greek verb, signifying "to bound."

† If you kneel at a window commanding a view of the horizon, and mark its position on the glass and then rise, you will see the horizon rise also, still retaining exactly the level of your eye.

taken from an eminence, or height in the air*, in which the horizontal line would be nearly at the top of the picture, while, in a view supposed to be seen by a kneeling or crouching spectator it would be comparatively low. The horizontal line should never divide the picture into exact halves. a formal and unpicturesque effect being thus obtained; nor should it be too high. Experience has shown us that it's best place is at rather less than half the height of the picture. The position chosen may have a tendency to destroy the proper effect of any view intended to represent *faithfully* some given spot; for instance, suppose such a view placed in a low, level plain, with no natural eminence from which the spectator might perceive it. If the horizontal line were, in this case, placed high in the picture the general effect would certainly be falsified, and the truthfulness marred to all who could recognise the view. A low horizon helps, therefore, to convey an impression of a low-lying, flat country, while, when much higher, it tends to convey an expression of high and mountainous ground; but even in this case it should not greatly exceed in height the centre of the picture, because in that case it would too nearly approach the bird's-eye view. Objects photographed in connection with the horizon, and situated upon an elevated pedestal, say, such objects as public statues, may derive increased dignity and importance from a low horizontal line; and, frequently, by raising or lowering it, the photographer may materially improve the photographic or artistic character of his views. Even Mr. Mudd's very beautiful picture of "Coniston Falls" would certainly have been improved, had the horizontal line chanced to be somewhat lower, so as to give either more sky, or less foreground (I should certainly have preferred the former, as in so exquisite a production it is quite hard to sacrifice even the slightest portion of the view). To conclude, the expression of the horizontal line should never be overlooked; for instance, if you were photographing a dog, horse, or cow with a landscape as a background the horizon should be so judiciously placed as to convey a correct idea of the size of the animal, and indicate how much the level of the spectator's eye was above the object.

* A bird's-eye view is, strictly speaking, such a view as could only be seen from a height inaccessible to any spectator but a bird, or from a baloon.

POSITIVE PRINTING ON ALBUMENIZED PAPER.

BY M. L'ABBE' PUJO.

THE various phenomena which take place in printing photographic proofs upon albumenized paper may be traced to three principal facts, two of which are well known to photographers; the third, to my knowledge at least, has not been explained by any one.

1. Pure chloride of silver, when exposed to light, becomes coloured violet blue, and, as the reduction proceeds, the colour becomes deeper and deeper. When the action of the light is concluded there only remains a brown grey powder, which is metallic silver: to prove this, it is sufficient to take a small quantity of this powder on the tip of the finger and rub it against some hard substance, the finger and the hard body both become strongly silvered. It must, however, be remarked, that if the chloride of silver be in a thick mass, only a very thin layer on the surface will be completely reduced; immediately beneath this the chloride will be found scarcely tinged with blue; at a little further in the mass it remains quite white.

2. Nitrate of silver, crystallized, or dissolved in pure water, is not changed in the light; but upon the addition of any organic matter, such as starch, gelatine, cellulose, &c., decomposition takes place. Also, a sheet of paper impregnated with nitrate of silver becomes coloured red under the influence of light, and becomes black when the exposure is prolonged. If a piece of paper be moistened in different parts by solutions of nitrate of silver of various degrees of strength, the parts moistened with feeble solutions continue red, while the parts imbued with a solution of the strength of 15 to 30 per cent., become black, and of a green bronze metallic colour. Besides, so long as the reduction is not advanced, the hue is red everywhere.

3. If a drop of nitrate of silver be poured into a solution of albumen, or *vice versâ*, a very abundant white flocculent precipitate is immediately produced. The question arises, is this substance simply a coagulum of albumen retaining in its mass a certain quantity of nitrate of silver, which cannot be removed by prolonged washing? or is it a combination of albumen and oxide of silver? or rather, which seems most probable, is it a compound analagous to that formed by bi-chloride of mercury, under similar circumstances? I shall not now decide precisely on the intimate constitution of this body; but reserve its consideration to the sequel. Besides, the chemical composition is unimportant in the aim I propose to myself.

This compound, which I call albuminate of silver, plays a very important part in printing positive proofs. And, moreover, every normal sheet of paper passed over a salted albumen bath, imbibes a quantity of liquid which varies from 4 to 8 cubic centimètres ($67\frac{1}{2}$ to 135 minims). Now, under ordinary conditions, 5 cubic centimetres of albumen solution contain 9 grains of pure albumen, and 3 grains of salt; so that when a dry sheet of paper is placed on the silver bath, albuminate and chloride of silver are formed. about three times as much of the former as of the latter. It is therefore certain, that generally, proofs are printed on a mixture formed of choride and of albuminate, but in which the albuminate predominates; and it may be conceived that the value of a proof is intimately allied with the modifications which each of these substances is susceptible of undergoing under the influence of light. Now albuminate of silver deprived of every trace of nitrate by prolonged washing, is, when exposed to light, coloured successively, rose, red, red purple, and brown purple. The facility with which it becomes reduced is second only to chloride of silver, Besides, a sheet of paper prepared with unsalted albumen and floated on a bath of nitrate of silver, becomes covered with a coating of albuminate of silver which may be deprived of the nitrate by repeated washings with pure water. This sheet, employed in the ordinary manner for printing a positive, will give a satisfactory picture, and even complete, which, after fixing, will present red hues, with well defined contrasts between the lights and shades.

In printing, the albuminate of silver always comports itself in the same manner, whatever its mode of preparation. In the pressure-frame it becomes coloured, as already mentioned, rose, red, red purple, purple brown, and towards the end assumes a brilliant metallic colour, but still red; in the hypo bath the image becomes fainter and of a rusty red hue, but upon drying it resumes nearly exactly the red hue it possessed in the printing-frame. It is useless to pass it to the toning bath, it cannot be made to assume harmonious tones.

Without going further, I may, from the above, draw the following conclusion:—whenever an operator perceives a sheet of paper assume a red colour in the printing-frame, with a brown or brown red metallic appearance, he may boldly conclude it will tone in the gold bath with much difficulty, the cause of which being that it contains too great a proportion of albuminate of silver. Now this excess of albuminate may proceed from—

1. Employing an albumen too little salted or not at all.
2. The silver bath being too weak.
3. The paper not remaining long enough upon the silver bath.

I think it useless to explain how these three causes produce the same result.

Chloride of silver cannot yield a good positive picture, because, 1st. as the reduction takes place only upon an excessively thin layer, the blacks, after fixing, are deficient in depth; 2nd. On account of the facility with which this body is decomposed by light, the whites, if not absolutely opaque on the negative, are printed on the positive. For these two reasons the image, after fixing, will exhibit the most meagre uniformity. Among the means which admit of taking a positive upon chloride of silver alone, I shall mention the following:—Sensitize a sheet of albumenized paper on a bath of silver strongly acidulated with nitric acid, and print it in the usual manner; the nitric acid prevents the reduction of the albuminate and of the nitrate of silver. An excess of chloride of silver may be easily recognised; in the pressure-frame the edges of the paper which project beyond the negative become coloured successively, lilac, blue violet, and violet black; and when the proof is removed from the frame it exhibits upon the half-tones, and even upon the whites, a general blue violet hue.

(*To be continued.*)

ON TONING POSITIVES ON ALBUMENIZED PAPER.

BY F. MAXWELL LYTE.*

If there is any intention of preserving the prepared paper for any length of time, it will be desirable to keep it in Marion's apparatus for that purpose. Nevertheless, if the albumen employed be fresh, and the paper of good quality, the paper will keep perfectly well after being sensitized some four or five days. Care must be taken to avoid the dissemination of the vapours of ammonia or of sulphuretted hydrogen in the room where the paper is hung, else it will become discoloured. For the same reason we must avoid the emanations from stables.

The taking of positives will be regulated by the taste of the operator; always keeping in mind that the vigour of the image is always diminished after being toned and fixed. Many theories have been put forth respecting the nature and formation of positive proofs; I give the preference to that maintained by MM. Davanne and Girard, who suppose that when the sensitized paper is exposed to light, and when the compound of nitrate and chloride of silver on the surface has undergone decomposition, that the chloride of silver is reduced to the metallic state, with liberation of chlorine; that this chlorine immediately attacks the free nitrate of silver with which it comes into contact, converting it into chloride of silver, setting at liberty nitric acid and oxygen. The first is then decomposed anew, a fresh quantity of chlorine being disengaged to react again as before, while the nitric acid is decomposed, in its nascent state, by the organic matter of the paper. Thus a decomposition and a recomposition is continually going on, until no more free nitrate of silver remains, and thus several successive layers of reduced silver are formed and constitute the dark portions of the picture.

In the case where the sky has been solarized, which cannot often be avoided, it will be necessary to paint along the line of the horizon, with opaque pigment, such as vermilion or chrome yellow. After taking a proof, the sky is cut out of it along the horizon. After slightly blackening this portion of the proof by exposing it for a few minutes to the sun, it is fastened on the negative with a little gum-water. This mode of proceeding is, however, impracticable when trees rise up against the sky-line. Care must be taken not to bring the paper too near this line, for its thickness will prevent the contact of the negative and the positive during the printing, and this will render the image indefinite in this place at least. It is to avoid this inconvenience that the skies are painted. The same result may be obtained by carefully levelling the edge of the paper cut out, which forms the sky, before gluing it on.

An entirely white sky generally impairs the harmonious effect of a proof, and it is very desirable to correct this defect. This may be accomplished in three different ways. The first and best is to print the clouds photographed from nature. The second consists in imitating the clouds with cotton arranged for that object between two plates of glass; and lastly, to make a tinted sky. The same principle serves as the basis of these three plans, viz.: the application of the negatives of natural or limited clouds, and (in the case of a uniform sky) of a clean glass upon the image, and covering the rest of the proof, which is made to move up and down so as to expose that portion of the sky which is to be tinted. The card-board must be kept constantly in motion, else a harsh line will be formed across the picture, and only that part of the sky which is to be tinted must be exposed. In this way, by a little practice, excellent effects may be obtained. Observers of nature have remarked how much deeper the blue of the sky is over head, than towards the horizon. This fact must be recognized by avoiding to darken the sky near the horizon; and in this manner a most natural effect may be produced without losing many interesting details by blackening the line of the horizon in the proof.

Immediately the proof is printed, it must be placed for half an hour in running water, in order to remove the greater portion of the nitrate contained in the paper. It must then be transferred from this bath into another composed of salt and water, in which it must be allowed to remain at least a quarter of an hour, and then submitted to the toning bath, which is composed in the following manner:—

Dissolve 10 grains of chloride of gold in an ounce of water, and 3 drachms of phosphate of soda in a pint of water; add the solution of gold to the latter, and the bath is then ready for use. Almost immediately on putting the proof into this solution its colour changes, passing from its red hue acquired in the salt bath, to a violet red tint, then violet, and finally a bluish gray hue. The toning can be stopped at any desired tint by removing the proof from the solution into a dish of clean water, in which it must be freely moved about.

While the proof is in the toning bath it must be kept in motion, and frequently turned. The temperature has much influence on the toning, and the room wherein the operation is performed should be kept warm, as under these conditions a given quantity of salt performs more work. The same result may be obtained by warming the toning bath, but it loses its activity on cooling, and becomes more inactive than before.

The solutions of chloride of gold and phosphate of soda may be kept separately for an indefinite space of time without undergoing any change; but when they are mixed, they must be employed as soon as possible, for they lose much of their activity in the course of a few hours. Old toning-baths may be mixed with the old hyposulphite to be treated with the other residues.

As the formation of the precipitate of gold takes place only on the dark portions of the proof, it will be economical to trim the edges before immersion in the toning bath; the black margins may be added to the residues. After removal from the toning-bath, the proof must be washed for half-an-hour or an hour in clean water; if this be neglected the proof will change its tint on immersion in the hyposulphite bath. The water bath seems to have the effect of fixing the colour of the picture; and if it be omitted, the proof on immersion in the hyposulphite becomes spotted and stained. Other spots arising from inequalities in the albumen, invisible at first, may also be produced at this stage of operations. Strongly albumenized paper tones more slowly than that which is slightly albumenized, but the tones are richer.

This process is inapplicable to paper simply salted, for which Mr. Sutton's *sel d'or* process is best suited, or the old method of the compound hypo and gold bath.

After immersion in the water a proper time, the proof must be placed in a bath of hyposulphite of soda, of the strength of twenty per cent., to which a piece of chalk the size of a pea is added for the purpose of preventing the formation of acid, and so decomposing the hyposulphite, and producing sulphuration of the proof.

* Continued from p. 160.

The proofs must be left at least two hours in the hypo, then washed in water. Many methods have been suggested for washing the proofs so as to completely free them from hyposulphite, but I know of none better than the old method of simply removing the proofs from one vessel to another, changing the water each time. I treat all my proofs in this manner, and wash them uninterruptedly for twelve hours. This is a tedious operation, but a successful one, and I have never had a faded proof. The same result did not attend a washing of six hours.

When the proof is washed it only remains to mount it. For this object, I take a piece of card-board somewhat larger than the proof, and fasten it on with starch paste. When dried the picture is passed through a rolling-press, and then varnished with the following compound:—

White wax	60 parts.
Spirits of turpentine	60 „
Fine Copal varnish	$1\frac{3}{4}$ to $3\frac{1}{2}$ parts.

The wax is melted in a galley-pot, and, after removal from the fire, the turpentine and copal are added. The varnish is applied to the proof by means of a piece of flannel and rubbed on briskly, then with another piece of clean flannel the proof is polished.

By this means the proof is not only protected against moisture, and deteriorating gases, but albumenzied paper gains considerably in brilliancy, and the deep shadows acquire an agreeable transparency.

ON LACY'S PROCESS FOR STRENGTHENING IRON NEGATIVES.

BY FRANCIS G. ELIOT.

The very beautiful results which may be produced by Mr. Lacy's modification of a process originally proposed, I believe, by Mr. Maxwell Lyte, tempt me to record my own experience, as to the best and simplest method of securing success.

Cleaning the Glasses.—All photographers who work with bromo-iodised collodion and iron developer, know that there is not nearly the chance of being troubled with dirty glasses, as there is with simply iodised collodion and pyrogallic acid development; and that clean pictures can be taken on old glasses by the former, which would give nothing but stained negatives by the latter; nevertheless it is necessary always to clean the surface, and especially for this process, as stains will often make their appearance in the strengthening, which were not apparent before. But grease is a terrible enemy, as if not perfectly removed, so as to allow water to flow freely over the glass, the film is almost sure to rise, and crack or break away in the last washing and drying. I prefer to simply wet the glass, pour on it a little old collodion, rub well over, wash well under the tap, wipe with a clean linen cloth, and polish with a perfectly dry one; hold to the fire till quite hot, and put into a dry plate box if not to be used immediately. I have no doubt a zinc or other metal box would be preferable to wood. I never use wash-leather, silk or other polisher of animal origin.

The Collodion.—The collodion for this process must, of course, be a bromo-iodised one; but it is necessary that it should be particularly fluid and free from gelatinization, and not over thick; therefore it is better to dispense with metalic iodides and bromides, and use those with alkaline bases; ammonium, potassium, or magnesium, will answer.

The Bath.—The bath is an ordinary 35 gr. one, tested in a good dark room, until free from fogging; adding, if required, dilute nitric acid one per cent.; as it gets old it may require testing again; it may have an addition of acetate of soda, but I think it just as well without, for reasons stated under the head of developer.

Exposure.—The plate must be fully exposed, as it is sure to be hard if not exposed enough; nevertheless it must not be too long, as it is apt to flatten the middle tints too much; the right time is soon learnt after a few trials.

Developer.—The developer I prefer is a simple one of 10 grs. of protosulphate of iron, 20 mins. of acetic acid, 30 mins. of alcohol to the oz. of water, not using any acetates or citric acid, or other organic chemicals; in fact, it seems to take the mercury better if the silver is reduced as perfectly as possible, and the film adheres tighter to the glass; therefore a small quantity of nitric acid would be preferable to anything else.

Fixing.—Hypo or cyanide may be used for fixing; if the former, the plate must soak for five minutes in water after the hypo is well washed off; the plate must be well washed again and left to dry *spontaneously.* If cyanide be used it should be very weak, but hypo is better.

Strengthening.—The plate must next be held to the fire until quite hot, and then left to cool; about one-eighth inch of the collodion scraped off all round the margin, and the edge painted over with C. J. Hughes's dead black varnish. When dry the glass must now be held under the tap to wet the film all over, and a two or three grain solution of bichloride of mercury being poured into a gutta-percha dish, the glass must be quickly immersed therein; it will take from half-a-minute to a minute or longer to produce the effect required, an over-exposed plate requiring longer than an under-exposed one; the only guide is the appearance: when the contrast is not quite so strong as a pyrogallic acid negative should be, it has had enough. The colour will be a dull grey: it should not be allowed to become white. It must then be taken out and gently washed under the tap; it will not require much as the liquid is only on the surface. The next operation is to hold the plate in the left-hand, and pour on from a measure glass or lipped bottle a solution of iodide of potassium of 2 grs. to the oz. of water; the film is rapidly changed from the grey to a dirty green colour by transmitted light, which is very impervious to the actinic rays. It now only requires gently washing, and must be allowed to dry spontaneously in a good draught of air: it should not be held to the fire until dry, as it is apt to make the film peel up. As soon as it is quite dry it is best to varnish with sœhnee or other varnish as quickly as convenient, as it seems to stain by the action of the air.

Conclusion.—I have been rather minute in describing this process, as I believe it to be a most valuable one; the negatives have all the sharpness and brilliancy of albumen ones with great softness, and from the great depth and richness they give to the paper in printing, they are most applicable to the new system of alkaline gold toning.

THE ALBUMEN NEGATIVE PROCESS

As Practised by Mr. Cramb.*

After stating that he did not claim any novelty or improvement in connection with the albumen process, Mr. Cramb remarked, his sole object was to give a reliable process by which fair negatives might be secured with the minimum amount of trouble and the maximum amount of certainty.

The glass he recommended was patent plate; any method of cleaning might be adopted, so long as the cleansing was thoroughly effected. He used first, a solution of common washing soda, and afterwards, plenty of water, drying the plate on a linen cloth, and not polishing with leather. We give the details with some condensation, in Mr. Cramb's own words.

Preparation of the Albumen.—I have not in my usual practice added either honey, gum arabic, dextrine, sugar, or treacle to the albumen; and whenever I have done so by way of experiment, the result has not encouraged me to continue their use. The addition of those substances has been recommended by those whose position entitles them to consideration; but in my experience I have neither felt the necessity for their addition nor the promised advantage when I have tried them. I have always preferred the use of simple substances, as far as possible, in my photographic practice.

The whites of any kind of eggs, I presume, would do. I have tried the whites of hen eggs for the most part: new-laid

* Mr. Cramb read a somewhat lengthy paper on the albumen process, as practised by him, at the April meeting of the Photographic Society of Scotland. Our space precludes more than an abstract of the practical details of the process.

country eggs are decidedly to be preferred. Opinion has been a good deal divided among photographers on the question of whether stale albumen will do or not. My experience of a very large amount of operating in albumen, both on glass and paper, has now fully confirmed me in my first opinion, that allowing the albumen to become stale is always pernicious, though I must confess to having at times inclined strongly in favour of allowing it to decompose partially before using. The whites may be separated from the yolk in any way the operator finds most convenient. Let him be careful to keep the smallest amount of germ or yolk from passing among the whites. The quantity of albumen in which it is proposed to operate should now be *thoroughly* beaten. The addition of a small quantity of acetic acid to the albumen to make it fluid, has been recommended, and has also been the subject of some discussion. I have tried it, and find it to answer the purpose proposed.

Iodising the Albumen.—Iodide of potassium is the iodiser most usually recommended. Any iodide will do, I think, except those metallic iodides which coagulate albumen. Iodide of cadmium does so, yet it has been recommended and pictures shown which were produced with its use. In my hands the addition of some iodide of cadmium to a basin of albumen turned it into a substance resembling sour milk. Iodide of ammonium has been much recommended. Its only advantage, I think, is that it generally contains a good deal of *free iodine.*

The addition of a bromide to collodion is now pretty generally recognised as advantageous. I have always used bromide in my albumen, and have no doubt I have obtained finer pictures than I could otherwise have got. A much shorter exposure *will do*, and, above all, it materially aids in getting *thin* pictures full of half-tone. Albumen, and indeed all dry processes, are apt to give harsh pictures if care be not exercised to avoid it.

The amount of iodide and bromide to be added is an open question, much depending on the purpose to which the plates are to be applied. I have no doubt that the degree of rapidity of exposure is in proportion to the amount of iodide, if the silver bath be suited to it. That conclusion, I am aware, is not in accordance with the expressed opinions of high authorities, but it is in strict accordance with my own experience.

With plates which I wished should possess the highest degree of sensibility I have used as much as eighteen grains of iodide of potassium and twelve grains of bromide of potassium to the ounce of albumen.

The formula most usually given is about 1 per cent. of iodide of potassium or ammonium. That will do well enough, but will be slow and will give hard pictures. The addition of one-third of a bromide and a little free iodine will make it work *clean*, and give fine thin pictures. Say to each ounce of albumen—

Iodide of potassium	4 grains,
Bromide of potassium	$1\frac{1}{2}$,,

and a very little pure iodine.

Dissolve these in as little water as you can, and add little by little, shaking or beating up the albumen as you do so.

After iodising and thoroughly beating up the albumen it should stand for some time. It will generally be ready in a day, or less.

Coating of the Plates.—It has been supposed to be very difficult to get an even or uniform coating on the plate. There is no difficulty in getting such a coating of albumen once on the glass; but there is some in having the plate *dried* so as to have a dry coating of equal thickness throughout. The use of a drying-box, in which the plates are all kept quite level while drying, and are also completely protected from dust, has generally been adopted. These boxes are constructed on various plans. A convenient arrangement is to have the box made of a size suited to take in the largest glasses we generally work. The glasses slide into grooves, which are so arranged that when one glass is level all are level. It is easy adjusting the box before we begin, so that one glass is so levelled. Between each glass, and alternately with them, thin boards are inserted, which have been previously made very dry: these absorb the moisture from the plates, and so placed, the glasses will dry in a few hours. The lid or door should slide so as to cover up each groove as we put a glass in.

I would have little hope of many amateurs being disposed to have such a box made before they know if they could succeed in taking a picture at all by the process. I will give a plan which gives as good results, but is a little clumsy and inconvenient where a quantity is to be prepared. No special apparatus is required to be got, except, indeed, a simple spirit level; and that I think every landscape photographer should carry with him wherever he goes to level his camera with. We want a levelled place to put our plates on: a smooth table, levelled by wedges under the legs, will do for that. We want a cover to protect the film from dust: here, in the recess usual at the back of a common bead picture-frame, is this protector. We next require something that will absorb the moisture: the deal back of the frame exactly suits for this purpose. For small plates and great exactness a piece of waste plate-glass may be levelled on the table, on which we place the prepared glasses, and cover till dry.

Every precaution to avoid the presence of dust being taken, the operation of coating is much the same as with collodion. Pour on an abundant amount of albumen to cover the plate easily; have a small piece of paper to guide the albumen over the plate, and to remove specks of dust and air-bubbles; drain off the superfluous albumen, leaving as much on as *you want*—more or less will do, and the operator soon learns to leave a regular quantity.

The Sensitizing.—The silver bath usually recommended, and which I alone used for a long time after I began the process, is:—

Water	1 ounce,
Nitrate of silver	45 grains,
Glacial acetic acid	45 minims.

This will answer admirably for plates with any iodising up to perhaps ten grains to the ounce of albumen. It gives slow pictures, however. An albumen plate is silvered in an instant, and I am unable to say I ever observed any difference between those which were only a few seconds in the silver bath and those which were for a longer time. The flow of silver over the plate should be very rapid, the most momentary stop leaving a clear mark. A dipping bath will suit well, but a flat bath I prefer. In a dipping bath bubbles are apt to form on the surface, which mark the plate: besides, a flat bath does with a very small amount of silver solution. A bath of this description, made of gutta percha, I found to answer very well in my journey through Palestine.

For rapid plates I would recommend more silver, say sixty grains to the ounce, and not more than a sixth of the amount of acid.

After sensitizing, the prepared plates are to be thoroughly washed to remove all the nitrate of silver that will wash out. For convenience and economy of water I generally use two or six dishes. On removal from the silver bath the plate is placed in No. 1 dish, and is there kept in agitation to prevent the insoluble silver salt formed from settling on the prepared surface, till nearly all the silver is removed; it is then passed to No. 2, and so on in succession to the last; finally washing for a short time under a tap, or by pouring water from a jug. I have been in the habit of using the ordinary water of the place I am in for all operations for which water is required in this process. Distilled water would be better for some purposes; but the advantage would not be anything like a compensation for the trouble and expense of procuring it in many places.

Keeping.—The albumenised plates, if properly dried and packed away, so as to be kept from damp, will keep for any length of time.

After silvering I have never tried to keep them longer than about six weeks, and generally I am content with keeping them a far shorter time.

Exposure.—The length of time required to expose for good results in any process is a matter on which no very definite rules can be given. Albumen is generally considered slow. Personally, I believe albumen to be the quickest dry process. I have not turned my attention much to rapidity of exposure, and not at all to instantaneous exposures. I believe albumen capable of yielding instantaneous pictures with no important difference in the plan of working I generally adopt.

Development.—The development of a dry plate is an important part of the manipulation. Almost any amount of exposure can be made to yield good pictures in albumen by adapting the development to the exposure: at least as much as a difference of twelve or fifteen times can be made to yield similarly finished pictures.

Any of the usual developing agents employed in other photographic processes will answer in albumen. I almost invariably use gallic acid, which I prefer to be warm, adding a little aceto-nitrate of silver. I develop in a porcelain dish, and generally have several going on at the same time. My usual mode of procedure is something like the following:—Get a kettle of warm water, put a little gallic acid in the dish, and pour the hot water over it. My finger tells me when it is about the temperature I want. I then add the silver, mix well, then drop in the plate. If properly exposed, the picture appear in about half a minute. I attend to one picture till I see how it is going on. If it can be left I proceed to another dish, and so to a third—seldom more, except they are much under-exposed; and even in that case I cannot have a large number profitably going on, as I prefer using a fresh hot developer if under-exposed. A picture which appears in less than half-a-minute will generally be fully developed in half-an-hour. I have had fine pictures fully developed in a few minutes, and I would always prefer to err on that side. Some of the finest pictures I have ever done were about an hour in developing. I do not at this time remember having got any very fine results by long development; but yet it is a great matter if by such means one can get a picture in a case in which, without long development, there would be none. The aceto-nitrate of silver to be used in developing should contain a larger *proportion of acid* than the sensitizing bath; and it is more convenient to have it weaker—say ten or fifteen grains to the ounce.

Fixing.—The fixing is done with a solution of hyposulphite of soda, of the proportion of one of hyposulphite of soda to six of water. I prefer it generally much weaker, and not alkaline.

General Remarks.—I would yet wish to say a few words on some of the special difficulties and objections to albumen. Small holes in the film are a frequent annoyance, and arise from several causes. Imperfect beating up of the albumen produces the innumerable number of minute holes equally distributed over the whole plate. Somewhat similar effects are produced by using impure or *alkaline* iodide of potassium. The use of *free iodine* prevents this.

Dust falling on the plates in any of the various stages of the manipulation will produce holes, but quite different in character, and only here and there, over the picture. Bubbles is another of the vexations. Abundant beating assists in preventing that, and having the plate in proper season when it is silvered,—not too dry. This is not a serious trouble at all, and can be readily *cured* by avoiding the use of *alkaline* hypo. or washing waters.

I conclude with an earnest recommendation to those who hear me to try this process. Begin with one egg. Nothing peculiar is required. But determine, before you begin, that one failure will not discourage you. If I can assist in helping anyone personally over a difficulty, my services are at the command of those who will try the albumen process; and nothing will give me greater pleasure than to smooth the path for fellow-labourers in the cultivation of our art in this department.

THE PROVINCIAL SOCIETIES AND THE EXHIBITION OF 1862.

We gave in our last a copy of a letter forwarded by Dr. Diamond to the provincial Photographic Societies in reference to the position of photography in the coming International Exhibition. We are glad to believe that the steps of the parent Society are meeting with a ready response amongst photographers generally. We have received the following brief notice of the steps taken by

The Newcastle Photographic Society.

A special meeting of the council of the Newcastle-upon-Tyne and North of England Photographic Society, was held on 18th inst., G. E. Warren in the chair.

The secretary produced and read a communication from the Secretary of the London Society, inviting their attention to that portion of the Regulations of the Commissioners of the International Exhibition of 1862, which relates to the photographic art, together with the letter of the Right Honourable Sir Frederick Pollock to the Commissioners, and the subsequent correspondence, together with the letter of Professor Playfair thereunto annexed, and requesting their opinion upon the course which, in the interest of the art ought, under the circumstances therein detailed, to be pursued.

After mature deliberation the following resolution was moved, seconded, and unanimously adopted, viz.:—That the council highly approve of the steps already taken by the council of the London Society, fully concur in all their opinions, and in their entire argument in favour of a more philosophical allotment to photography in the classification of the Commissioners, and a position for specimens of its productions in the closest proximity to the group of fine arts; and with respect to the questions of the appointment of a committee and the exhibiting of photographic works, they beg respectfully to submit it in their decided judgment that neither the one nor the other ought to be done, unless the Commissioners concede the just and reasonable claims made on behalf of the photographic art, by the council, while at the same time they are prepared cordially to adopt and proceed upon whatever decision the council may see it most expedient in its wisdom finally to take.

2. It was unanimously resolved, that the warmest thanks of this council be conveyed to the council of the London Society for their highly laudable vigilance and attention to the honour and interests of the art of photography.

It was further unanimously resolved, that the above resolutions be submitted for sanction, rejection, or amendment, to the members of the society at a general meeting to be duly called by the secretary, and held in the Tower, New Bridge Street, on Friday, the 21st instant, at 8 o'clock, p.m.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 19th June, 1861.

M. Roman, of Wesserling, announces a method by which he can obtain on dry collodion pictures as rapidly as upon wet, by a slight modification of the Taupenot process, which demands an exposure six times as long as wet collodion requires. Whether M. Roman has been anticipated in his modification, I cannot venture to say, for amid the multitude of suggestions for improvements, it is scarcely possible that one may not escape the most retentive memory.

M. Roman's improvement consists, firstly, in washing the plates slightly after the first sensitizing, so as not to completely remove the free nitrate of silver. Secondly, to employ a *warm* instead of a cold developing solution. Being convinced that the plates sparingly washed in the collodion, although dry externally, are nearly in the same state as when newly sensitized, except the excess of nitrate left on the exterior of the film in the wet process, M. Roman attempted at first to make up the difference, by the use of warm pyrogallic acid in developing; the results were tolerably satisfactory, only the pictures were rather hard, and not sufficiently deep in the shadows. Attributing this defect to the absence of the *external* excess of nitrate of silver at the time of developing, he immersed the plate in a bath of aceto-nitrate of silver, and developed it with *warm* pyrogallic acid, also acidified with acetic acid. The picture then developed perfectly, in every respect equal to a proof taken upon wet collodion. To sum up the features of this modification, we say, that to obtain a proof upon dry collodion as rapidly as upon wet, wash the plate sparingly, leave upon the collodion a certain quantity of nitrate of silver (which the external dessication probably leaves slightly moist), then, after exposure, restore to it the excess of nitrate necessary for a good development, and lastly, make use of warm pyrogallic acid.

M. Van Monckhoven, who is engaged upon a course of interesting researches upon developing agents, after essaying chloride, iodide, and bromide of ethylamine he has tried with marked success, the sulphate of uranium, which he finds to be a very energetic developer, employed in the same manner as pyrogallic acid, but requiring a still shorter exposure than when sulphate of iron, is adopted. The pictures acquire extraordinary vigour, the development at first proceeds very slowly, but suddenly becomes very rapid, and, when complete, its further progress, must be stopped by immersing the collodion plate in water.

M. Kuhlmann has made some important researches upon methods for utilizing the residues obtained in the manufacture of soda. These residues have been a constant source of annoyance to the manufacturer, as they accumulate rapidly and emit fetid gases, which are a nuisance to the neighbourhood. It often happens that the masses of residues inflame spontaneously, and then, in addition to the ordinary emission of sulphurous acid, hyposulphuric acid is given off. These local combustions, which cause great elevation of temperature, become evident to the eye by a deposit of sulphur in the form of large, perfectly crystallized needles, which are formed at the orifices of the fissures where the decomposition of the hydrosulphuric acid by the sulphurous acid takes place. In the interior of the mass of residue which have remained some years in the air, cavities are found lined with magnificent crystals of a golden yellow colour, the composition of which appears to be 1 atom of sulphite of lime, 2 atoms of sulphide of calcium, and 6 atoms of water. Exposed to the atmosphere these crystals lose their yellow colour, and become bleached as their oxidation proceeds. Their crystalline form is a right rhomboidal prism, the modifications of which yields hexagonal plates with bevelled edges. To turn this class of residue to account, another is added to it, no less embarrassing; the oxide of iron, resulting from the combustion of pyrites, substituted of late for sulphur, in the manufacture of sulphuric acid, in consequence of the high price of this mineral. It was natural to conclude, if the action of oxide of iron was sufficiently energetic to burn organic bodies, that this oxide might be usefully employed to burn the sulphur of the oxysulphide of calcium and convert this latter into sulphate of lime. This conclusion was fully justified by experiment.

Equal parts of the residues of the soda vat, and of the residues of the combination of pyrites, were mixed into a paste and ground in a mill, and afterwards moulded into bricks, which become as hard as burnt clay bricks by being kept in a moist atmosphere, and ultimately become very sinorous; their colour is brown red, like ordinary pottery. When this new cement is sufficiently consolidated by remaining many months exposed to the air, although slightly porous, it resists the action of frost; and, still better, if it be mixed with a solution of silicate of potash after a certain time of consolidation in the air, and in either case, the results may be ameliorated by adding a tenth part of slaked lime to the mixture of the two residues.

Here, then, we have not only a means of getting rid of two waste products, but also of converting them into valuable materials, the applications of which are very numerous, not only to the manufacture of bricks, as explained above, but as an ingredient of concrete, for the facing of walls as a cement, for foundations of walls, &c., and for the repair of roads.

DEPTH OF FOCUS IN PICTURES.

Dear Sir,—The professors of fine art and those of science, have, unfortunately, never appeared to possess much in common.* The sage whose mind was so absorbed in seeking truth, mathematical wise, that he shook his wise head at Milton's "Paradise Lost," because it proved nothing, might have been an oracle of science, but he knew little of art. I was not altogether, therefore, so much surprised, as I might otherwise have been, to read Mr. Shadbolt's remarks at the last meeting of the parent Society, on the subject of "Depth of Focus."

A picture, *no matter how produced*, is purely a conventional affair. The representation has no object in actual relief; all its forms, dimensions, distances, and appearances are neither deceptive nor intended to deceive. Its brightest light, white paint or paper, in its utmost purity, is black compared with the sunlight of nature; and its deepest shade, a black surface reflecting light, is white compared with the perfect privation of light, &c. In short, it is the production of art and not of nature. For Mr. Shadbolt, therefore, to argue that the picture on the eye's retina, when we look stedfastly at any one object in a view, is exactly the picture the artist would desire to produce, gives the artist credit for a mistake he never could tumble into.

If Mr. Shadbolt will only try to look steadfastly at any one object for a few seconds, he will discover that even with an organ which obeys so readily the mind's slightest will, it is a task of some little difficulty, so accustomed is the eye to shift and vary its focus when looking at the objects before us. And again, when Mr. Shadbolt's eye is thus stedfastly fixed upon any one object, he will at once perceive that little beyond that one object is clearly defined, or, if he will permit me to use the term, sharp.

Now, as the eye is thus proved to instinctively and imperceptibly vary its focus so as to take in, at a glance, the full details of many more objects than could be so distinctly visible when one only was looked at; it follows that the painter or photographer has a perfect right to represent that amount of "depth of focus" which the brain, rather than the eye, takes cognizance of when we examine any natural objects upon different planes of vision; such depth of focus being really only bounded by the organization of the eye, and the presence of the atmosphere.

I would here take the liberty of suggesting to our opticians that, as lenses are to produce pictures, and not illustrations of optical peculiarities, it is rather to artists, than to those whose attainments are purely scientific, that they should look for stray hints; the art's progress being, in this respect, one with their own repute and prosperity. A lens which gave such a picture as the eye sees when looking stedfastly at any one object would, it certainly strikes me, be received with derision by both artists and photographers, as I think Mr. Shadbolt must before this have perceived.

Upon Mr. Shadbolt, as an authority in photography, I have myself looked with so much respect that, had I been less familiar with this matter, his influence might have been mischievous; and for the benefit of others with similar feelings, but who have thought less about pictures than myself, I feel bound to publish these few lines. I waited to see if anything more explanatory made its appearance in that gentleman's own excellent journal before sending these remarks, which I hope will not be either misunderstood or misrepresented, as I fear certain other remarks of mine have recently been in that gentleman's last leader.—I am, dear sir, yours truly, Alfred H. Wall.

[An article on this subject was in type for last week's issue, but left out for want of space. We cannot but think, in deference to Mr. Shadbolt's good sense, that some misapprehension of terms exists somewhere, as, without the quality in discussion, a photographic *picture* would be, if not an impossibility, at least, something even worse than a Chinese painting.—Ed.]

PICTORIAL *versus* OPTICAL FOCUS.

Dear Sir,—I find in your report of the last meeting of the Photographic Society, that Mr. Shadbolt, in a discussion on depth of focus, "*contended that it was true art to produce a picture similar to that formed on the retina of the eye.*"* It is much to be regretted that gentlemen will talk of things they certainly don't understand; and I hope you will insert the following quotation from an eminent living artist (G. Barnard), in refutation of Mr. Shadbolt's singular assertion; not that the fact stated requires any particular authority to support it beyond ordinary common sense. The quotation runs thus—(in the *elementary* instructions given to a *beginner*, remember).

"Pictures are not judged by the strict laws of optics—they are altogether conventional; in nature, we cannot look at the distance and foreground without *imperceptibly* altering the focus of the eye; neither can we look at two portions of a picture at the same moment, with attention, without altering the direction of the eye; it will, therefore, be sufficient if our studies afford us the power of giving a general appearance of reality, reserving for the most careful finish those portions of the picture intended to attract the eye of the spectator."

The next time Mr. S. so dogmatically denies "in toto" assertions proceeding from an authority, he should know something more of the facts denied * * * I hold

* I believe photography has for one of its most beautiful and promising missions the effecting of such an union.

* See last report of the Photographic Society, in which Mr. Shadbolt's remarks are in direct contradiction of our correspondent's quotation.

you culpable, and wanting in duty to your readers, my dear Sir, if this be not inserted. I forgive the non-insertion of my last remarks on this gentleman's art-blunders—but let this appear, and oblige—Yours, R. C.

[Before receiving this letter we had written an article on the same subject, in which, as regards the question in discussion, we had given expression to similar views. Mr. Shadbolt looks at the question from a scientific point of view, and having been much engaged in microscopic pursuits, regards accurate definition of objects on a mathematical plane as the chief characteristic of a perfect lens. We hold that the perfection of a lens depends on its being efficient for the work for which it is intended. If a mathematical plane only be intended to be depicted, then the lens which would most accurately define that plane would be best; but where a number of planes have to be depicted, then the lens is best which will give to each sufficient definition, each in its proper relation. If we did not insert R. C.'s former letter it was simply because we were indisposed to publish disparaging criticisms on the remarks of a gentleman who has laboured long and honourably in connection with photography, and deserves well of photographers. Although we do not entirely coincide with Mr. Shadbolt's views on the question in discussion, and think the quotation from Barnard interesting, we would rather R. C.'s letter had been conceived in a better spirit. He will perceive that the passages elided from his present letter did not add to the value of the argument, whilst they did add to its offensive tone.—Ed.]

Photographic Notes and Queries.

The Solar Camera Patent.

Sir,—Having read an article in your last Photographic News on the Solar Camera, and the various remarks on the same by several gentlemen, members of the South London Photographic Society, induces me to write for your opinion and advice. 1st. If a photographer constructs a camera for photographic purposes to work with the oxyhydrogen light, the lens being different, without reflector, is it an infringement of patent? 2nd. If the lens of the camera are altogether altered, and additions made so as to improve the solar camera, can the improvement so made protect parties that work the camera for large pictures from all law proceedings? 3rd. Can you tell me the name of any gentleman that would take an interest in the affair. I am a photographer, working for a weekly salary, and if my improvement on the solar camera is worth anything, should like to reap a little benefit thereby.—I remain yours truly, R. H. C.

[In answer to your two first questions we may state that the patent has been suffered to lapse, and is now public property, as we explain in another page. 3rd. We cannot tell you. By advertising you would be most likely to meet with such aid.—Ed.]

Ancient Camera Landscapes.

Sir,—In an old work, entitled "Graphice, or the most excellent art of Painting," printed in the year 1658, for Robert Crofts "at the Signe of the Crown in Chancery Lane, under Sergeant's Inne," I find the following, which perhaps may amuse modern sun painters:—

Page 86.—"The draught of a landskip mathematicall; they that have leasure and desire thereto, may make experiment.

"A Landskip.—Set up a little black tent in a field, made easie, portable, and convertible, as a windmill, to all quarters at pleasure; capable of no more than one man with little ease; exactly close and dark, save at one hole, an inch and half diameter, to which apply a long prospective trunck, with a convex glasse; fitted to the said hole, and the concave taken out at the other end, which extendeth unto (about) the middle of this erected tent; through which the visible radiations of all the objects without, are intermitted, falling upon a paper which is accommodated to receive them, and so trace them with your pen in their naturall appearance, turning this, your little tent round by degrees, till you have designed the whole aspect of the place. There is good use hereof in chorography; but *to make landskips hereby were too illiberall.* Surely no painter could exceed the precisenesse of these." I remain, Mr. Editor, yours truly, Exeter.

Preservative Cases.

Sir,—Is it not right that your readers should be informed of a serious defect to which "Marion's preservative cases" are liable—the spontaneous liquefaction of the "dessicating substance" used? Mine has been in use for over a year, and has acted well, until a fortnight ago, when a clammy slightly coloured liquid began to ooze out from behind the "chassis." I have already collected a wine-bottle full of it; and it is still flowing.

The liquid is a chloride; dropped into nitrate of silver, the white substance forms on the surface, and falls to the bottom of the glass in large flakes, heavily and slowly, unlike the action of salt and water dropped into a nitrate solution.

Atmosphere, or use, have had little to do with the matter; my case has been kept constantly closed, in a very dry drawer. I do not believe that more than 30 sheets of paper have been ever placed in it—they have always been thoroughly dry, for I sensitize at night, and only place the sheet in the case the next morning—after the pressure frame, too, in which I leave it for two or three hours, not to dry it, but to make it smooth and even for the plate.

"Accident" is out of question, none could possibly have occured. In fact, the great specific gravity of the liquid, about 1·360, precludes the idea of "accident."

I have found the case so useful, that I greatly regret its being liable to this defect, and only notice it in the hope that Mr. Marion may be able to devise some cure for it.—I am, sir, your obedient servant, N.

June 16th, 1861.

[It is quite clear that such a result as our correspondent describes must sooner or later be brought about in all preservative cases, as it is in virtue of the affinity for water of the dessicating agent that such cases act. The chloride of calcium, most probably used in this case, has gradually become saturated with water. In all such cases there should be facility for changing or drying the dessicating agent from time to time.—Ed.]

Want of Intensity in Fothergill Plates.

Sir,—I have been working for the past two months Mr. Sebastian Davis's collodio-albumen process (11 × 9 plates) and find difficulty, even with a liberal dose of silver in the developer, in getting a sufficiently intense negative; the details may be brought out, but there is a want of vigour or contrast. I use ——'s negative collodion. Is there any other make on the list that you think would answer better for this process?

In several negatives small spots of a light brown colour have made their appearance, in one instance before varnishing, and in the others a few days afterwards. Can you tell me the cause of these, and how to avoid them?

On the whole, the process, I think, offers many inducements to amateurs; and if you can kindly help me over the difficulties now named, it would result in my having some fair pictures for the amateur and exchange club by the close of the season.—Yours, respectfully, M. B. Joye.

Manchester, June 10th, 1861.

[We have not used Mr. S. Davis's modification for plates so large as our correspondent, but have found no difficulty in getting intensity in plates $7\frac{1}{2} \times 5$. It is quite possible that with a lens of long focus greater difficulties might be experienced. Try the final application of a solution of either tannin or gallic acid. We have tried the former on plates prepared by that process with success. The collodion, No. 2 on your list, would perhaps give you a little more intensity, but it is uncertain.—Ed.]

Colouring on Albumenized Paper.

Dear Sir,—I don't know whether any of your correspondents have tried a plan for colouring portraits on albumenized paper, which I have found very effective; it is merely to mix the ordinary moist water colours with a solution of albumen, about three ounces of water to the white of one egg.

The advantage of this plan is, that the glossy surface of the paper is not impaired, and the colour does not rub off as when dry colours are used: of course the colour must be applied quickly as it very soon dries.

I shall be glad to hear, in the next number of your journal, if you think this plan a good one.—I am, sir, yours truly, A Stranger.

15th June, 1816.

[The suggestion is certainly worth trying. We have never used the method; but it may, in many cases, be useful. The alkali in the albumen will slightly affect some tints.—Ed.]

Talk in the Studio.

The New Shakespeare Portrait is to be tested by a committee of eminent Shakespearian scholars, with a view to proving its authenticity.

The Art Department of South Kensington has given instructions for photographing the magnificent selections from the famous Campana specimens of sculpture by Michael Angelo, Donatello, Lucadella Robbia, and other eminent Italian masters.

The Guarantee Fund of the Great Exhibition has been announced at the sum of Four hundred thousand pounds.

The National Gallery has received three additional pictures by Roger Van der Weyden, Fra Giovanni Angelica, and Piero della Francesca.

Universality of Photography.—The professors of our art are acquiring a decided character for ubiquity. The *Times* correspondent, referring to the movements of the army in the quondam United States, after describing the various appendages and followers of a moving army, says: "The unfailing photographer, who may now be regarded as the pioneer of civilization, and who marches with his friendly arm to the western desert, is, of course, here," &c. &c. In a law report in the same journal we find another illustration of the universality of the profession. A witness describes himself as "a comic singer, a cigar shop-keeper, as one who let lodgings to 'professionals,' and—a photographer!"

To Colour Glass Yellow.—A very simple and efficient substitute for yellow glass may be produced by the following method:—Make a saturated solution of saffron in water, and immerse in it a plate coated with collodion precisely as with the silver bath. The collodion rapidly absorbs the orange yellow dye of the saffron, and the plate assumes the aspect of beautifully stained glass. In trying this method, for which we are indebted to Mr. Breese, of Birmingham, we macerated half a drachm of saffron in about five ounces of water, and used a thick-bodied collodion. A glass so prepared was placed over a piece of sensitized paper for half-an-hour in a diffused light without any actinic effect being produced. For a dark room or box, where sensitive collodion is used, two or three thicknesses would probably be desirable. Travelling photographers will find this a ready method of improvising yellow glass in an impromptu dark room. We commend this to the attention of those who fancy non-actinic glass is not to be had, as Mr. Breese, who works with chemicals sufficiently sensitive for the most instantaneous effects, frequently avails himself of this method of illuminating his dark room. It will be found an excellent addition to yellow glass of doubtful non-actinic character.

Dry Plate Box.—We have received from Mr. Keene, of Leamington, a specimen of his preservative non-chemical plate box for storing dry plates. It is unquestionably an admirable and ingenious contrivance, and likely to come into general use amongst dry plate photographers. That the vapours of pine produce an injurious action on sensitive dry plates, many photographers are convinced; and Mr. Keene has found that the substitution of metal for wood, whilst possessing many advantages, is also attended by at least one serious evil: small particles of metal being occasionally cut from the grooves by the sharp edges of the glass, which particles attaching themselves to the sensitive surface, and thus produce spots and comets. To meet the difficulty, this contrivance is provided. The box is of metal, but the grooves, which are formed so as not to scrape the film, are of gutta-percha. The lid is admirably contrived so as to exclude light, fitting into a groove on the outside of the box of at least an inch deep; the whole is secured by a simple but efficient fastening. Nothing better can be desired for the purpose for which it is intended.

Forbidden Photographs.—A gentleman writing to the *Times*, describing Austrian amenities on the Venetian frontier, states that after the officials had overhauled a lady's luggage and found nothing contraband, they discovered a small album of photographs, and on examining it page by page, found a portrait of Garibaldi. "With all the proper gravity of so solemn an occurrence, the detested album was laid hold of by the assembled detachment. The iniquitous portrait was extracted with due reprobation, and then condemned to the flames!"

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

To Correspondents.

*** We shall be glad if any of our subscribers or agents have one or more copies of No. 59, which is quite out of print, and we have several applications for it.

Sea-side.—Moisten the starch first with cold water, or else you will not be able to manage it at all. Use just as much cold water as will moisten the whole of the starch powder, and make it a thick paste. Unless you get it entirely moistened thus first, it will go into lumps when you add the boiling water; and if you add too much cold water at first, it will so rapidly cool the water which is added, that the proper gelatinous condition of paste will not be produced.

R. H.—The usual method of removing mastic varnish from a painting, is by friction. Slightly moisten the middle finger and proceed to rub the varnished surface gently. It will gradually abrade the surface, and the varnish will rub up and come away, leaving the painting clean. If the painting was seasoned sufficiently before varnishing there will be no difficulty; but if the varnishing followed too soon upon the painting, as in colouring photographs is too often the case, the varnish may, to some extent, have combined with the paint, and it will be difficult to remove. Varnishes may be removed by solvents, but this should only be attempted by practised hands, as there is danger of removing the paint as well.

Glasguensis.—The film drying partially when the plate has only remained a minute or little more in the camera seems to indicate that the collodion is of a very horny structure and very repellant of water. Except in excessively hot weather it ought not to dry in several minutes. Try another collodion, or add about a drop of distilled water to each ounce of the collodion you are using. We frequently allow a plate to drain a minute on blotting paper before placing it in the camera. When a plate is found to have become partially dry, from any cause, before developing, moisten the whole surface with as small a quantity of distilled water as possible, and then add that water which will have taken up the free silver which is on the plate, to the developing solution, and proceed as usual. This will prevent any risk of stains. We prefer an earthenware jar or basin for making pyroxyline. A glass bottle is rarely sufficiently wide, whilst it is too deep for convenient working. There is no objection to glass as a material, if it have been well annealed.

J. C. B.—Is thanked for his communication, which will appear shortly.

G. S. Penny.—Your communication was duly received, and either was or should have been acknowledged with thanks at the time. It will appear shortly.

William Dodson, and a Pupil of a Californian Photographer, are thanked for communications which we shall use shortly.

T. Y. Kimpton.—We have at present stock of the numbers you mention. We posted your letter. If you send us an addressed envelope, we can give you information on the subject you name.

W. W.—A coating of isinglass or gelatine is used to prevent the oil colours sinking into the photograph. It is better applied in two or three thin coatings than one thick one, as the danger of the preparation subsequently cracking and leaving the albumenized paper, is less. We have found the ordinary magilp an excellent medium for the purpose, but do not dilute the tints too much, or the picture will rapidly turn yellow and horny.

J. G. F.—The use of the rising front is to allow you to modify the relative amount of sky and landscape in your picture. You will only need to use it in special cases.

M. A.—The stains on your print arise from handling the paper after it is excited, and during the printing, with fingers not scrupulously chemically clean. Your fingers have probably been in contact with hypo solution, and only wiped, not well washed. In each one of these stains, both in front and back of your picture, there is the imprinted texture of the finger ends. By all means tone and fix separately. The muddy brown colour in the washing water before fixing should not occur; that proves that you have put fingers into it which have been in contact with hypo. You still require more vigour in your negative. The subject selected is very picturesque, and would be very fine indeed if you had a good negative of it.

H. W. Ball.—A bath ought not to need sunning, even when constantly in use, more than once in a few months if it receive fair play. Perhaps the marks on your background arise from irregular draining of the plate: possibly from over-iodized collodion; possibly from immersing the plate in the bath too soon; possibly from contact with the holder in your dark slide. We cannot say with certainty without seeing them.

F. L. R.—Your negative is evidently too weak and thin throughout. It does unquestionably as you state possess half tone, but it possesses little else, and it is just as great an evil, although not quite so common, to have nothing but half tone as to have entire absence of that quality. With such a negative a slight intensifying with pyrogallic acid and silver after fixing, would have been a great improvement, just giving that decision and crispness to the few high lights which is necessary to make the picture brilliant.

Ignoramus.—If you will send an addressed envelope, we will give you such information as we can by letter, as we cannot enter into the matter here. In answer to your two first questions, as far as we can understand them, yes.

A Rat.—It entirely depends upon the tone required as to what developer is used. As you will see from an article on another page, some of the finest transparencies we have seen are developed with iron, and intensified with pyrogallic acid. The latter generally produces a warmer tone than iron. It is difficult to copy paper prints without showing the grain of the paper, but the difficulty may be reduced to a minimum by judicious management. See report of the last North London meeting for information on the subject. Use any good bromo-iodized negative collodion. When Mr. Laws directs the use of citric acid in the usual quantities, he leaves the matter to the discretion which he naturally expects his readers to possess. No definite quantity could be properly stated as it must vary with the strength of the pyrogallic solution, the temperature, the bath, &c. As a general rule, about one grain of citric acid for every two grains of pyrogallic acid may be used; or a little more in very hot weather. Three drachms of citric acid to an ounce of developing solution must be an error, or is simply an absurdity. A little practice with the materials you have in hand will be your best guide as to the most suitable method of producing transparencies. The matter is very simple and very interesting when once set about.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 147.—June 28, 1861.

PHOTOGRAPHY AND THE INTERNATIONAL EXHIBITION.

As our readers are already aware, the last step taken by the Photographic Society of London regarding the question at present pending between photographers and Her Majesty's Commissioners for the International Exhibition of 1862, was to forward a circular, containing the correspondence, to each of the secretaries of the various provincial societies, and also to the representatives of the continental societies, soliciting from them an expression of opinion on this important question, so that any resolution they may lay before the Commissioners in their final reply, shall be the result of the united and deliberate opinion of the whole body of photographers both in England and abroad.

To obtain such an expression of opinion must necessarily be a work of at least a few weeks. In some cases the matter has already been brought before ordinary meetings which have met in due course since the issue of the circulars; in others, special meetings have been called; and in others, the opinion of members has been sought by letter. In the recently issued *Bulletin* of the French society we notice a full attendance is bespoken for the next meeting, in order that the matter may receive the consideration which its importance demands. The results of this universal action have not yet reached us, but we have little doubt but the general tenor of the replies will express approval of the steps taken by the Council of the Parent Society.

This being the case, we can scarcely entertain much doubt of a final issue, which shall be, at least in some degree, in accordance with the claims made by the Society. A further representation, backed by the universal opinion of photographers and photographic societies both in this country and on the Continent, will surely be sufficiently influential to induce the Commissioners to reconsider their decision and make some concessions. But in the mean time it is important to consider the alternative in case of failure. In the letter addressed to the various societies, the Council of the Photographic Society state that, as matters stand, the consideration is forced upon them, as to whether it will not be their duty to recommend those photographers "who look upon their art as more than a mechanical process to abstain altogether from exhibiting any of their works."

Now we must confess that we should look upon such an alternative, even if it could be carried out, as a most serious evil, and one much to be deprecated. That our art should be entirely unrepresented in such an exhibition would be a loss not easy to be estimated. It is true the disgrace would belong to the Commissioners, but the loss would be that of the art and its admirers. The proposal to hold, separately, an exhibition of photographs, would prove but a very inadequate substitute for a representative position in an international undertaking. Moreover, it is tolerably certain that the withholding of photographic contributions from the Exhibition of 1862 would be but partial, and that instead of an entire and dignified absence, the result would be, simply, a partial and imperfect representation of the art, the true explanation of which, would be somewhat difficult to impress properly upon the minds of the public at large.

We think, then, that these and other considerations render it somewhat important to deliberate whether, in the event of failing to obtain all that can be desired from the Commissioners, it may not be desirable to accept the separate department already offered, and appoint a Committee, in accordance with the desire of the Commissioners, who may so arrange, that the tools of our art, and the productions of its artists, shall be distinct and separate in the department under their direction. We think there are many reasons why a separate department, especially if the nominal as well as the actual classification could be modified, would be more desirable than a position wholly and entirely among the Fine Arts. Already there are indications of a feeling amongst some photographers to the effect, that whilst they are not satisfied with the proposed classification, neither would they be entirely pleased with a simple and unqualified position amongst the Fine Arts. Dr. Lockhart at the Newcastle Society contends that photography cannot be logically or philosophically called a fine art. Mr. Sebastian Davis, at the South London Meeting, contends for a representation of the present state and progress of photography as a science, which would be inadmissible in a department devoted solely to the Fine Arts. Moreover, the exhibition of photography in immediate juxta-position with paintings and engravings, might not be altogether desirable; their excellences are altogether distinct things, and we are not sure that the juxtaposition might not, in some cases, be to the disadvantage of photography, at least in the minds of many, who would not discriminate the true grounds of the respective merits of each. It is quite certain, moreover, that many photographs will be exhibited which can in no sense be regarded as works of fine art, and could merely tend to illustrate how little claim photography possesses to the position demanded for it.

If then the Commissioners could be induced to remove photography from its mechanical associations in the second section, and catalogue it in the fourth section, we think there might be positive advantages in the separate department offered. It then might be admitted that photography was a thing *sui generis*, at once a science and an art, its productions in both relations demanding a distinct consideration and representation in such an exhibition.

In expressing ourselves somewhat favourably to such a concession as accepting a separate department, we do not fear being misunderstood. Our readers will not believe us to be very ready to sink the art consideration of photography. But besides the considerations we have urged there is another element in the case to be considered. It is quite evident that the *amour propre* of the Commissioners is, to a certain extent, concerned in maintaining the position they have assumed. They may be glad to make concessions where they will obstinately resist the idea of an entire surrender of their position in the matter. We must confess we should like to know the name of the worthy to whom the brilliant idea first occurred, of placing photographs amongst patent buffers, improved switches, and the latest novelties in scaffold poles or ship's tackle. Such a classification we can scarcely conceive to have been the deliberate judgment of a body of gentlemen like her Majesty's Commissioners. The idea having been conceived, however, by some one, has been adopted by them, and they are concerned to defend it. It was Sydney Smith, if we remember rightly, who remarked that outrageous actions would often be done by men, in their corporate capacity, of which they would be ashamed individually, because "a corporation has neither a body to be kicked nor a soul to be saved." It is with a body of gentlemen acting in this corporate capacity we have to deal; and if the end desired can be gained without an entire reversal of their position, which would amount to a confession of error, then we have something to hope; but if, on the other hand, we demand a formal recantation and a complete reversal of their decision, we fear that all our efforts will be simply labour in vain.

Scientific Gossip.

Adulteration seems to set its mark upon everything employed by the photographer. Our nitrate of silver* contains nitrates of potash or lead. Our iodide of potassium is contaminated with carbonate, sulphate, or chloride; hyposulphite of soda is sometimes so adulterated with sulphate and sulphite as to be unfit for use; our pyrogallic acid contains empyreumatic oils; our sulphate of iron contains copper; our alcohol, fusil oil and water. Our ether is methylic; our chloride of gold contains almost everything but gold; our gun cotton will not dissolve; our yellow glass "warranted non-actinic" lets the light through in unwarrantable quantities (about which we shall have more to say presently); our gutta percha is a mysterious mixture of clay and mahogany dust; our nitric acid contains chlorine; the very glass on which we take our pictures "sweats" and disintegrates from excess of alkali; and now our paper is about to follow the universal law of this age of shams and adulteration. A few weeks ago some stir was made in the leading journals respecting the shameful way in which printing paper was got up abroad and sent over to this country at a price which could not be approached by the more scrupulous British maker; but whilst it was natural to suppose that adulteration would step in to swell the profits of the consumer in cases where (as in some of the cheap weekly journals) a difference in price of one farthing per pound is equal to some thousands a year profit or loss, photographers have a right to fair treatment when they are willing to pay a comparatively high price for what they use. But it seems that human nature, or at least the commercial development of it, is incapable of resisting the chance of increased profits, and we are sorry to find that our photographic paper is now gradually being nibbled at. Complaints have for some time past been made to us of the inferior quality of paper, especially the cheap foreign varieties now in the photographic market. They would not tone, they spoilt the baths, and altogether acted in a way which the users of good paper were unaccustomed to. To casual observation these papers presented nothing remarkable. They have a considerable degree of hardness and opacity, and in that respect contrast favourably with some papers which are in reality of first rate quality; for a pure paper made from the best descriptions of linen or cotton rags, and well-sized with gelatine and a little alum, or with starch, &c., as frequently employed in foreign mills, has a semi-transparent appearance similar to parchment. Of this class are the kinds used for the manufacture of bank notes and the so-called "loan paper;" which have extraordinary power of resisting the wear and tear of rough usage. For some time past it has been the custom to increase the body of such paper by the introduction of a small portion of kaolin into the pulp; in fact, most of the cream laid writing paper owes its beauty to this or similar admixture; and when the proportion employed is limited to the amount necessary to counteract the transparency of a pure linen fabric, and the mineral matter is no more injurious than pure kaolin, we should consider that such an admixture was quite as legitimate an ingredient in the manufacture of paper for photographic purposes as the alum employed in its size. Rags, however, are dear, and are likely to be dearer still before long, whilst clay is always to be had for the digging, and manufacturers have consequently kept on adding more and more of the mineral constituent until it has become so excessive as not only to be an adulteration, but also to affect very considerably the beauty of the positive print. Fortunately, the photographer can readily test the quality of paper in this respect. He has only to burn a piece of it slowly, and notice the ash which it leaves. Good paper (of which that commonly known as "Swedish filtering," made by Munktell, may be taken as the type), leaves a scarcely appreciable amount of ash on burning, and this is so light and feathery that a breath blows it away. Clayed paper, on the contrary, leaves a grey friable residue, having the form and apparently the texture of the original paper, and consisting almost entirely of clay. We have here described extreme cases in each instance. Probably no photographic paper could be made as pure as Munktell's unsized paper; whilst it is not likely that such an extreme case as a 33 per cent. adulteration will come in the photographer's way, and spoil his baths for a long time; but the evil is creeping on, and should at once be stopped. The actual amount of clayey matters, added to the pulp, can be readily ascertained. Weigh out 100 grains of paper, and burn it in a thin porcelain crucible, or platinum dish, until the ash is white or at most grey, no black carbon remaining unconsumed; then weigh the whole and subtract the weight of the crucible (previously ascertained) from the joint weight of crucible and ash. The ordinary scales in common use will be quite accurate enough if they will turn to half a grain. If the 100 grains of paper were Swedish filtering paper the ash would not weigh enough to be sensible, whilst in a heavily adulterated paper the amount left might be as much as 33⅓ grains, or one-third the weight of the paper taken. As we said above, if pure china clay were the only mineral employed, and it were not present to a greater extent than five per cent. (or even a trifle more, if the paper were good in other respects), it might be considered a legitimate constituent; but photographers ought to make an energetic protest against a higher per centage than this, for several reasons. It is an adulteration of an inferior for a valuable article; it communicates brittleness of structure and rottenness when wetted, the heavy mineral matter tending to disintegrate the fibre when undergoing prolonged washing; and the clay present not taking the salt and silver solutions so well as the linen fabric, gives a woolly granular appearance to the positive, which is also wanting in vigour. The most serious fault, however, of kaolin in paper is this: it is well known that this earth has the property of absorbing colouring matters with extraordinary avidity, and it is on this account that photographers use it to remove the colouring matter which gradually accumulates in the positive bath in which albumenized sheets have been excited. Now what holds good in the case of free kaolin is likewise observable when it is mechanically intermixed with linen fibre; if the positive bath is in the slightest degree discoloured, the kaolin in the paper exerts its affinity for it, and the certain consequence is that the white parts of the picture suffer in purity. Even if a perfectly colourless and new bath be employed, the same thing is likely to occur. There is always a certain reaction between the silver and the matter used as a size (albumen, gelatine, &c.). In ordinary cases, the slight darkening produced by this cause washes off in the different baths; but if kaolin be present, it will be firmly fixed in the paper, and injure the brilliancy of the picture.

If such are the evils of pure kaolin, they are even worse when other bodies are employed. Plaster of Paris, from its slight solubility in water would, in addition to its mechanical objections, have a chemical action upon the various baths which cannot fail to be injurious, whilst, if inferior kinds of clay are used, they would have all the ill effects of china clay with that of their own bad colour superadded.

* We are of course referring to cheap, unauthenticated materials. The photographer can generally make sure of getting what he wants free from adulteration by going to a good house and paying a fair price.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Idealizing.—By this term we convey the impression of an art creation, which, taking nature for its model, yet so combines the various excellencies and beauties of the many in the one, that the production is recognised as something apart from, or superior to, nature. Certain modern artists have, however, so degraded the meaning of this term that even the mere mechanical enlargement of eyes, straightening of noses, pursing up of lips, together with the unnatural ludicrous diminishment of the hands and feet have been dignified under the term *idealizing* to the exclusion of higher and far worthier aspirations. An elevated conception wrought out harmoniously in all its features and details, although in perfect accordance with the truths of nature, will be said to be *idealized*, and a perfect, or very nearly perfect model (such may occasionally be discovered) would, even if executed with the fidelity of a photograph, be termed *ideal*, that is to say, *if painted*, for I do believe that were it possible to discover a living fac-simile of the Medicean Venus, and photograph the same, your bat of an art critic would, just now, see nothing in the picture but repulsive indelicacy and ugliness, and would turn from the same with virtuous indignation to contemplate with rapturous expressions some such scene as that recently painted by ———, in which the half-naked and voluptuous forms of a group of charming female models are associated which suggestions which I am positively afraid to refer to more definitely.

Imaginary.—The education of the imagination is one of the artist's chief duties, and should be refined and cultivated with untiring care and study. The picture should live in the imagination long before it is executed by the hand. Rejlander looked about for his model of John the Baptist for nearly twelve months, and when he did meet a gentleman whose head resembled that he was in search of, he never met him without seeing his head on a charger instead of the shoulders it rightfully belonged to; therefore, I do think, that had I described this photograph of Rejlander's as an imaginary subject, I should not have been far from the actual truth. The imagination is the eye of the mind, with which, when darkness has closed up the outer sight, we still see. But it is only when the fancy has the power of creating that the "mind's eye" has the power of seeing, and this creative power is always more or less the result of education and cultivation. I therefore look upon the neglect of such a quality as something positively criminal, tending, as it does, to destroy one of the most beautiful of that great, good Creator's loving gifts to man: for as we lose our limbs when they are kept continually inactive, so do we lose our mental organs from the same degrading cause. Thinking thus, I grow fretfully impatient when owlish, old-fashioned folks denounce all works of imagination, and think there are no poems worth the reading but those in their hymn-books, and no facts save such as are to be discovered in histories biographies, and newspapers. What can such know of of poems or paintings, and how can such hope, when they take up photography, ever to produce works of art. If you would become an artist—no matter through what medium—you must not neglect the imagination. There are those who will endeavour to persuade you that such imaginations as our great works of art display, are traceable purely to intuitive genius, which is a special gift only vouchsafed to the elected few. I don't believe them. Such reasoning had its origin in a mere excuse for laziness, or for shirking the tedious plodding toil of beginning at the beginning. Of course the chances to which we owe the thing called genius are rare; but as the world progresses they will become less so, and then such artists as were once known when the imagination was the most cultivated portion of the mind (cultivated at the expense of every other organ by that priestcraft which so well knew the power of superstition as created out of the imagination) will be as plentiful as ever.

Imitation.—Not even "sharpness" has been so great a source of mystification and controversy among photographers as "imitation" has been among painters and fine-art writers. How far, and to what end it is to be carried, and what method is best for its attainment, are questions continually exciting discussion. Some enthusiasts, in the egotism of their love, almost seem to fear lest the power of the *artist-man* should soar to a level with that of the ARTIST-GOD; and looking, not upon the miserable inefficiency of their petty means, or the presumptious folly of their vain ambition, they cry aloud to the aspiring artist, "Stop! stop! lest you should render your imitations no longer *art*, but *nature!*" This question is intimately associated with that of the position photography may claim as a fine art. If, as some assert, the loftier qualities of art can be discovered in the scenes of nature, or, as Sir T. Brown says, in "the art of God," then, any art, sufficiently imitative, may reproduce such in its works. If, on the other side, as is also asserted, art *alone* originates such qualities: it then remains to be seen whether photography does not possess sufficient control over its imitative resources to produce similar effects. My own opinion, as frequently given in former articles, is too well known to my readers to need repeating here, and the real solution of the question will be found rather in our works as photographers than our works as writers. Art was undoubtedly given by the Great Creator of the universe to develop the nobler aspirings of the human mind; and that art which can accomplish this has always been regarded as the loftiest and the best. The rules of art should rather be regarded not as beauties chosen for so adorning and perfecting its productions that nature may thereby be *surpassed*, but rather as crutches for its support and assistance. Such rules should teach him the folly of merely imitating the inimitable; of halting and limping so very, *very* far after nature, and all the time, ludicrously enough, pretending to be running a race with her for perfection, should show him that while he chronicles the scenes about him as faithfully as his little means will permit, and makes the most of them the while, he should so blend therewith the records of human thoughts, as expressed in the spiritual utterances of nature, that his poor imitation may "snatch a grace beyond the reach of art," and claim a far nobler mission than even the utmost perfection of mere imitation.*

A curious distinction has been upheld by the poet Coleridge, the painter Fuseli, and very many other eminent men, both artists, poets, and critics, between imitation and copying. Imitation being said to be perfectly legitimate, and copying exactly the reverse. The meaning of such assertions is very easily perceived perhaps, unless you insist upon taking the two words for exactly what they are worth in the dictionary; but such novel definitions do little beyond rendering confusion more confused. Copying is regarded by these eminent individuals as the mere *mechanical* means, while imitation, which certainly demands the *intellectual* agency of art, as well as the mechanical, may be regarded as being, in reference to art of course, something beyond mere copying. These writers, however, are frequently quoted as evidence against photography as a fine art by those who think the imitation of a photograph is of the kind implied by this use of the term copying.

Much confusion, again, has been generated by writers who have regarded deception as the end of imitation, forgetting that from the very nature of our materials deception must be, in any case, a positive impossibility. It is true that we hear the ancient painters praised because their works were so natural that birds and beasts even were deceived by them; but I have yet to learn that birds and beasts are particularly acute judges in these matters. Certainly, I have seen birds alarmed in mid-day at an old coat and hat on a stick, which formed about as miserable an imitation of humanity as could well be invented, when I knew well enough that if one of Sir Joshua's most forcibly delineated and natural portraits were laid face uppermost in a field, these same saucy little warblers would have hopped as impertinently and fearlessly over eyes, nose, and mouth, as if the canvass had not the most remote appearance of humanity in any one of its numerous appearances. When, therefore, I read authors who denounce imitation because it may lead to deception, I regard the ghost they thus create with a smile as a mere bogie for frightening children, or an ingenious excuse for those who shrink in laziness or cowardice from rendering nature as she is, turning with affected disdain from the real to some mean con-

* It must not be supposed that I denounce imitation, but I merely urge the importance of art's higher aims.

ception of their own, which they foolishly term ideal. You would not attempt to walk through the frame of a picture into the scene depicted, nor would you recognise the sculptured Venus for anything but marble; the chalk drawing is, at the slightest glance, palpably chalk, and the camera picture's first impression conveys the fact that it is neither more nor less than a photograph, in short, deceptive. Imitation can hardly exist in connection with any one branch of imitative art, and there is no reason why we should desire that it should.

INSTANTANEOUS COLLODIO-ALBUMEN PROCESS.

The particulars of a highly interesting dry process have recently been published in Paris, by which. it is stated, pictures may be produced with as short exposures as are necessary in the wet collodion process. The details are published in a pamphlet by M. Chevalier, and we have for the last few weeks been hoping to procure a copy, but have not yet received it. As a brief allusion is made to the process in the letter of our Paris correspondent last week, and our readers may be anxious to hear something more of the matter, we avail ourselves of the kind permission of our good friend Mr. Sutton, to make use of the abstract of the process which he issued in a recent number of the *Notes*, the copy of the pamphlet from which it was taken having only been lent to him for a few days, he was unable to place it at our disposal. Mr. Sutton describes the matter as follows :—

"M. Arthur Chevalier, optician at Paris (son and successor of the late Charles Chevalier), has just published a pamphlet the title of which will put every one of our readers on the *qui vive*, and fill him with impatience to know more of its contents, or they are not the enthusiasts we take them to be. The title of this pamphlet is 'Photographie ;— Lettre à M. Arthur Chevalier concernant un procédé sur collodion sec aussi rapide que le collodion humide ; par Mons. G. Roman, de Wesserling.' That is to say, M. Roman has communicated, in a letter to M. Chevalier, the particulars of a dry collodion process which is as sensitive as the wet one; and this letter is published in the pamphlet alluded to, and can be obtained from M. Chevalier, No. 158, Palais Royal, Paris.

"In the preface, M. Chevalier says, 'I have seen the last proofs by M. Roman. The delicacy of his landscapes leaves nothing to be desired, and his portraits upon dry collodion are as soft and fine as those taken by the wet process. This is a very important step, and one which will attract to photography all those who have hitherto been afraid of the necessity of preparing their plates at the time of using them.'

"Now for the process itself. But first let us remark that the tone of M. Roman's letter conveys the idea of perfect truthfulness and frankness. There is entire freedom from exaggeration. He gives his *reasons* for what he recommends,—which is so rarely done by writers on photography. He writes with the feeling of a man who understands and appreciates a fine negative; and he enumerates the hundred little cares which the experienced practical photographer so well knows to be essential to a high order of succees. We are much pleased with M. Roman, and put faith in what he says, because he appears to write honestly from his own large practical experience.

"M. Roman's rapid dry process is simply a modification of that of Dr. Taupenot,—and it consists in not thoroughly removing the whole of the free nitrate in the last washing; —and developing with *hot* pyrogallic acid. In his concluding remarks he positively affirms, 'not only are my dry plates as sensitive as those prepared with wet collodion,— they are even *more* sensitive.'

"We cannot, of course, translate the entire pamphlet, but the following indications of the process will be sufficient guide to those who wish to know something about it, and to give it a trial.

"The plate is collodionized, excited, and washed as usual, in Taupenot's process; then bromo-iodized albumen is poured over it, and it is dried and put away until ready for use. The bromo-iodized albumen is composed thus :—

Albumen	110 grammes.
Water	50 ,,
Iodide of ammonium	$\frac{1}{2}$,,
Bromide of ditto	$\frac{1}{4}$,,

"This is beaten up in the usual way, and to the liquid, when settled and decanted, are added 3 grammes of ammonia.

"These dried plates are insensitive to light, but they should be prepared in the dark room, and not in daylight. In order to excite them proceed thus :—

"Immerse the plate for 30 or 40 seconds in a bath of aceto-nitrate, made thus, and always cleared with kaolin :—

Nitrate of silver	8 grammes.
Glacial acetic acid	8 ,,
Water	100 cubic centimètres.

"On its removal from the bath the excess of liquid is allowed to run off, but not till it does so in drops, and the plate is then put into a dish of water, and afterwards into a second. This is all the washing it is to have, and it may now be put away for use in the camera within 36 hours; that is from the morning of one day to the evening of the next. Within that time the film of collodion does not become thoroughly dry, and the plate retains its sensitiveness unimpaired.

"The exposure is the same as for wet collodion, and the image is developed in the following way with *hot* pyrogallic acid :—

"The plate is first dipped into the last exciting bath of aceto-nitrate, and left there for half-a-minute. The back is then wiped with blotting-paper, and the plate put film upwards into a bath of pyro, heated to about 120°. The proportions of this bath are :—

Water	100 grammes.
Pyrogallic acid	$\frac{1}{2}$,,
Glacial acetic acid	10 ,,

"The image appears immediately, and as soon as all the details are fully indicated the plate is removed from this hot bath,—washed,—slightly rubbed with cotton wool to clean the image from deposit,—and then put into a fresh cold bath of pyrogallic with a few drops of silver added. The image becomes now rapidly intense. No heed need be taken of stains, because these can be rubbed off after the picture is fixed. The entire development occupies about 10 minutes, and the picture is then fixed and finished in the usual way.

"Such is M. Roman's sensitive dry process."

POSITIVE PRINTING ON ALBUMENIZED PAPER.

BY M. L'ABBE' PUJO.*

Albuminate of silver yields an image with well-marked contrasts, rather hard even : the chloride, on the contrary, a picture which may be pronounced as too uniform, or flat. Therefore, in varying the proportions of these two elements, by employing simply albumen more or less salted, or a paper more or less porous, the operator can obtain at will any effect he may desire. But this will not be sufficient : the positive proof must also present another quality; it must be in good condition for toning. Now, every photographer has remarked, 1st, that a proof that always remains red or brown, and becomes of a red metallic colour, never tones well ; 2nd, a proof tones well when on removal from the pressure-frame, the blacks are of a green bronze metallic colour ; the toning being much more rapid and beautiful as the metallization is more advanced and greener in hue.

* Continued from p. 292.

This is but a consequence of a fact, which I shall now explain, *i. e.*, the toning consists of a precipitation of gold from the bath by the metallic silver which forms the image, a precipitation similar to that which takes place in the same bath when the image, instead of being formed of molecules of silver, is formed of molecules of copper or of zinc; only the silver, which belongs to the same section as the gold, can only precipitate the latter metal slowly and with great difficulty. This established, we may easily comprehend that the more molecules of metallic silver there are upon a given point of the positive, the more prompt and abundant the gilding (toning) will be. To obtain a good toning consists, therefore, of accumulating as much metallic silver as possible in the reductions which form the image. And this is the part the nitrate of silver plays.

A sheet of paper imbued with nitrate of silver only, will give an image; but it requires two whole days exposure in the sun; while, in the presence of chloride and albuminate of silver, the reduction of the nitrate of silver proceeds more quickly, and shows itself in a bronze-green metallization on the edges of the paper which project beyond the negative. The proportion of nitrate must not, however, be unreasonably increased in the positive baths. Too large a quantity of this salt remaining on the proof either maintains the paper in a constant state of moisture, the image being then of a uniform blue or grey tone, or in the crystallizing it will break up the surface aud produce a multitude of holes, and destroy the negative also. If the quantity of nitrate cannot be conveniently reduced below 20 per cent., it ought not to exceed 40 per cent.

A proof when taken from the printiug-frame is formed of three super-imposed images, the first furnished by the albuminate, the second by the chlorides, and the third by the nitrate of silver. The albuminate and the chloride, in well chosen proportions, give the true relations of light and shade. The nitrate of silver, in reducing itself with facility by the presence of the chloride and the albuminate, accumulates metallic silver everywhere where reduction takes place, and thus powerfully contributes to supply the element necessary to touing.

I shall notice, *en passant*, a fact which explains why positive paper keeps without deterioration in boxes with chloride of calcium. A sheet of paper, sensitized in the ordinary manner, was freed from the nitrate of silver by repeated washings in pure water, and put into a tightly closed box. After the lapse of several months it still retained its primitive whiteness. (This single experiment will require to be repeated to be confirmed.) From this it results that the deterioration of positive papers is due to the chauge in the nitrate alone; and as the reduction of the nitrate can take place only in presence of moisture, there are ouly two means of preserving the paper, either by removing the nitrate, or by keeping the paper in a state of absolute dryness. In selecting the latter, the best selection has been made, because the nitrate is necessary to the production of a good image.

ON TONING.—No toning bath can be compared with that of chloride of gold, for beauty and variety of hues, and especially with respect to permanence of the proof. In this bath the proof becomes covered with a protective coating of the most unoxydizable of the metals; for a proof properly toned will not completely disappear in boiling nitric acid, and a silver button, which I had every reason to suppose exempt from admixture of foreign metals, immersed in this bath for 48 hours, became covered with a metallic coating presenting the colour and brilliancy of gold, which resisted the oxydizing flame of the blow-pipe.

This bath may be employed before or after fixing. Employed before it may sulphurise the proof, unless the process indicated by Mr. Maxwell Lyte be adopted. In fact, the least trace of acid from the decomposition of the nitrate suffices to set the sulphur free. I prefer to fix the proof first, and afterwards immerse it in a toning bath composed as follows :—

Water	35	ounces,
Hyposulphite of soda	3½	,,
Chloride of sodium	2½	,,
Chloride of gold	30	grains.

If the addition of the chloride of gold causes a precipitate of sulphur to appear, the bath must be left several days to settle, then carefully decanted and filtered.

Every proof after six hours immersion in this bath should have its bronzed metallic blacks of a fine, velvety, black colour. To make the light lilac hue disappear which sometimes covers the half-tones, it is sufficient to pass the proof into a bath of cyanide of potassium of the strength of one per cent., which causes all the proofs to become blue black in a few seconds.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on the evening of Thursday, the 20th inst., at St. Peter's School Rooms, Walworth Road. The Rev. F. F. STATHAM, A.M., F.R.S., in the chair.

After the usual routine proceedings tho Secretary read the report of the Committee. (See p. 305.)

Mr. S. FRY had pleasure in proposing the report be received and adopted. Regarding a subject referred to in tho report, in connection with which his name was mentioned—a process for dispeusing with the silver bath—he wished to observe that he had withdrawn from all councctiou with it. The discovery was Captain Dixon's, and it now rested solely in his hands.

Mr. BORCHERT asked if tho process were really likely to supersede the method of operations at present in use.

Mr. FRY scarcely liked to give an opinion. The process undoubtedly possessed great promise. Mr. Simpson, the editor of the PHOTOGRAPHIC NEWS, had both seen some of the pictures produced by it, and had himself produced some. Tho process had sufficient promise to induco him at one timo to believe a complete revolution in the practice of collodion photography was not improbablo. He still believed the process was capable of doing much; but how far, under existing circumstances, it was likely to be carried out, he should not like to say.

Mr. FITCH seconded the adoption of the report, which was carried.

Mr. HOWARD remarkod, if anything were needed to give emphasis and effect to somo of tho propositions in tho report, perhaps the reading of the Treasurer's statement of accounts would add that, for it would be seen there was really a deficiency of £3 16s. This arose partly from the preliminary expenses incidental to the commencement of any society, and partly from other causes; the amount was not serious, and might easily be distributed over two or threo years for payment. After a mature consideration of the subject, tho Committee had come to tho conclusion that it was much better for the Society to cease to supply, or identify itself with, any Journal, aud loavo each member to subscribe to such as as he might choose. Tho Treasurer's accounts, which had been examined and found correct, stood as follows :—

RECEIPTS.		EXPENDITURE.	
Subscriptions ...	£26 18 6	Various Expenses ...	£31 4 8
Cash in hand June 1860 ...	1 0 1		
Balance due to Treasurer	3 16 0		
Total ...	£31 4 7	Total ...	£31 4 8

There were still some liabilities outstanding for school-room, gas, &c.; but there were also subscriptious outstanding to the amount of £3 8s. 6d.

The CHAIRMAN suggested that it would be a much more satisfactory arrangement of the small deficiency existing could it be made up at once by each member contributing a small sum. This was done, and a sum of about £2 raised in a few minutes, leaving the deficiency merely nominal.

The CHAIRMAN was unwilling that this portion of the business should be concluded without proposiug a vote of thanks to their excellent Secretary. Much of the success of the Society he was sure, was due to the untiring energy and enthusiastic interest of Mr. Wall; the consequeuce was that the members generally, without any trouble to themselves, were certain to find something interesting and instructive provided at each meeting during the session.

Mr. Howard, in seconding the motion said, none knew so well as himself, and the Committee generally, how much the success of the Society depended on the constant and never-flagging exertion, in its behalf, of Mr. Wall; whoever else failed, he was always at his post.

The vote was carried by acclamation, as were also votes of thanks to the President and Treasurer.

The ballotting papers were then called in, and the following gentlemen were announced as unanimously elected officers for the ensuing year:—

President.—The Rev. F. F. Statham, A.M., F.G.S.

Vice-Presidents.—Sebastian Davis, G. Wharton Simpson, C. Jabez Hughes.

Treasurer.—F. Howard, 12, Whittingham Villas, Studley Road, Stockwell.

Honorary Secretary.—A. H. Wall, 11, The Terrace, Walworth.

Committee.—Messrs. Hannaford, Fry, Leake, jun., W. Clark, Fitch, Quentery, Borchert, Foxlee.

The Chairman then called the attention to a letter from Dr. Diamond as Secretary of the Photographic Society of London, and pointed out the anomalous position in which it was proposed to place photography in the International Exhibition of 1862. (See below.)

The subject of the out-door meetings of the Society was next taken into consideration, and it was finally agreed that as the meetings of the society will in future be held on the second Thursday in the month, the out-door meetings were to be held on the second Saturday in the month. The appointed *rendezvous* for the first meeting is West Croydon Railway Station at 2 o'clock, p.m., on the 13th of July, thence to proceed to Beddington Park. Should the weather on that day prove unfavourable, the meeting will be held ou the 20th.

The proceedings then terminated.

THE SOCIETIES AND THE INTERNATIONAL EXHIBITION.

South London Society.

At the ordinary meeting of this Society, held on the 20th inst., the Rev. F. F. Statham, A.M., F.R.S., in the chair, the subject of the proposed classification of photography in the International Exhibition, was brought under attention.

The Chairman, after calling attention to the anomalous classification proposed, thougbt it was important that the various societies should endeavour, by a united expression of opinion on the subject, to induce the Commissioners to reconsider their decision on the subject.

The Secretary read some portions of the correspondence on the subject, with which our readers are already familiar. He then proceeded to say:—The question to which our attention is called appears to be somewhat complicated. That photographers who live by their professiou *will* exhibit their works at the forthcoming National Exhibition cannot be doubted. Applications for space have been already made, and preparations are being carried on for such purpose by most of our best men. Photographic societies are powerless to prevent this, and as a matter of business alone it is too important to professional men for us to expect that they will neglect their own personal interests for the sake of advaucing their art in public estimation. Nor, it may be reasoned, while the absence of photographic productions would not tend to remedy the mischievous tendency of this strange arrangement of Her Majesty's Commissioners, the presence of first-class photographic pictures would certainly tend to show the world how little the art deserved the degradation it had been forced to submit to. From one of the letters I have read, it will be perceived that certain concessions have been made, inasmuch as we find that they state that there is nothing to prevent photography being placed in a separate room, or in juxtaposition with engravings, or any other analogous and suitable class of objects. To such au arrangement there cannot be any very great objection I should think. But next comes the great bug-bear and difficulty. The commissioners seem willing to give us the half-pence we solicit, but we must also take the kicks which accompany them. In other words, photography must not claim a more important position than that accorded to its apparatus. Well, what is to be done, or, rather, what *can* be done? If the council of the Photographic Society refuse to appoint a Committee to look after the interests of the art, and see that it is fairly represented by the productions exhibited, it is not at all unlikely that a crowd of photographs will appear in the Great Exhibition of next year which will *really* be more fairly the productions of lenses and cameras, than heads and hands; and the art, in consequence, may receive so serious a blow, that its advancement in public estimation, and its consequent progress as a branch of pictorial art, will be thrown back for very many years to come. The occasion is, indeed, a most important one, and, as a society, we shall not do our duty if it does not receive serious consideration. I therefore call upon you, gentlemen, to give the officers you have elected such aid in drawing up a reply to Dr. Diamond's letter as may enable them to represent well and truly the opinions of the members generally, in reference to the matter in dispute. I should be very sorry to see our beautiful art degraded to the level of machiuery and apparatus. I should be just as sorry to see it unrepresented next year, and still more sorry if it should be unfairly represented. However, I do think that by appointing the Committee requested by Her Majesty's Commissioners the Photographic Society would be in a better position to urge and enforce the claims of the art, although if we *do* take the kicks with the half-pence, we should at least protest against the former as being perfectly undeserved, and emanating purely from gross ignorance and obstinate bigotry. Before concluding I will just add that photographs are not yet strong enough, *as works of art*, to compete with the professional painter, or first class engraver, and this would only be made too apparent to those who would overlook the infantine coudition of the art, and the want of art-education in the photographer, and saddle all faults of the individual on the back of photography. Of course, there are many photographs—I am proud and happy to say, *very many*—which as pictures even could not be surpassed by the productions of any artist, but these are rather the exceptions than the rule at present, although we have excellent indications in the present condition of artistic photography from which to augur "a good time coming."

Mr. Sebastian Davis said: Although cordially agreeing with the general protest that has arisen from the photographic world against the attempt to lower the position of its artistic productions from their rank as works of art, I must at the same time call attention to the necessity of recognizing the distinct interest attached to many pictures intended solely to illustrate the principles involved in their production. It is in consequence of overlooking this distinction that many persons are apt to pronounce an unjust sentence upon the artistic capabilities of photography, and to pass a deprecatory estimate upon the art itself. They disregard the fact that a photograph may possess an intrinsic value apart from any pretensions to pictorial excellence. It frequently happens, moreover, that the photographer is called upon to delineate objects of great interest with an accuracy and fidelity at variance with the exercise of artistic skill. The representatiou, for instance, of an event of public importance, the opening of any national building, the arrangements for carrying out any great engineering project, the registration of meteorological or electrical changes, would be most valuable records of a passing event, without necessarily having any pretensions to rank as a work of art. But although wanting in the latter respect, such a record or records could not justly be regarded as the mere offspring of mechanical arrangements, nor as devoid of the power of awakening intellectual pleasure. To promote, therefore, a correct appreciation of the full scope of the powers of photography in the public mind, I advocate the recognition and classification of photography generally under the two distinct heads of "Art-Photography," and "General or Applied Photography." It appears to me that by impressing the public mind with an understanding of the existence of this two-fold feature of our art, art-photographs would be estimated according to their true value as works of art, and that this estimation would act as a stimulant to make them increasingly more so. General or applied photography would then upon the other hand be valued as possessing merits peculiar to itself, and be regarded in its special character as a valuable adjunct in the promotion of scientific typographical, and industrial advancement. The estimatiou of a photograph, even in the latter point of view, has no right to be reckoned as a mere mechanical performance; it is a scientific production dependent for its existeuce upon the discoveries that have arisen from the exercise of mathematical, optical, and philosophical skill. By conceding that such productions should be distinguished from art photography we by no means admit that we lower their dignity; the principles of their production bespeak the language of poetical beauty, inasmuch as they consist in the adaptation of the force existing in a ray of light to pourtray the object or scene from which it has been reflected. The twin sisters Science and Art undoubtedly coalesce together in nearer harmony in the productions of photographic results than in the kindred works of Painting, Engraving, or Sculpture.

Mr. Wall thoroughly endorsed the remarks made by Mr. Davis. He had urged such considerations in connection with the last exhibition of the London Photographic Society both in the British Journal of Photography and in the Photographic News, but the present question bore more especial reference to artistic photography, and he was glad to find this branch of the art had now created for itself a larger circle of enthusiastic friends than it once appeared likely ever to possess.

Mr. Davis thought it important that artistic photographs should be admitted as works of fine art; but also wished it to be remembered that illustrations of processes, such as those once exhibited by Mr. Burnett, which possessed the highest scientific interest, but were not in the usual sense works of fine art, should not be excluded.

The Chairman thought that some arrangement should be made for a proper classification of such subjects as Mr. Davis had referred to, together with photographs of machinery, anatomical preparations, &c.

Mr. G. Wharton Simpson said there could be no doubt whatever there were in photography, as in every other system of pictorial delineation, different classes of subjects, some of which possessed a purely scientific interest, others simply of a mechanical character, whilst others challenged attention as works of fine art. There could be no doubt also that, as photography embraced all these subjects, in a complete exhibition of the present state of the art, facilities should exist for the adequate representation of each. That part of the question might he conceived, however, be safely left in the hands of the Committee of Photographers, who should be appointed by the parent society, to co-operate with Her Majesty's Commissioners in case a satisfactory arrangement as to the classification were arrived at. Such a Committee would not be likely to fail in providing a fitting position for all illustrations of the scientific progress of photography, as well as of its capabilities in an artistic direction. The question now for their consideration was, whether they were to strengthen the hands of the parent society in its protest against the extraordinary classification into which, whether inadvertently or of intention, it was proposed to be placed by Her Majesty's Commissioners. He thought that as a society they were bound to give whatever force they could to the protest of the Parent Society, and aid them in securing, if possible, a classification more in accordance with the true character of the art. Personally, he could see many advantages in the separate department which the commissioners had stated they were willing to concede; he could see many practical advantages in such an arrangement. But the nominal insult would remain, and photography would be written down in the records of that great international undertaking as possessing no higher artistic claims than cart-wheels and ship's tackle. There was the sting. If the insulting classification could be removed, then he could see good reasons for accepting the arrangement proposed. In the meantime he thought it was their duty to express a cordial coincidence in the views already propounded by the Photographic Society of London in regard to this matter, and begged to propose for the adoption of the meeting a resolution to the effect. He had not intended to make any remark on the subject, and merely proposed his resolution in the absence of any other which might possibly better express the feelings of the meeting. The resolution was as follows:—

"That this meeting expresses its hearty concurrence in the steps already taken by the Photographic Society of London towards rescuing photography as an art from the degrading position in which it is placed in the proposed classification of Her Majesty's Commissioners for the International Exhibition of 1862; and desires to thank the Council of that Society for thus endeavouring to maintain the dignity of our art. That this Society desires further to express a hope that if it should eventually be deemed prudent, in lieu of any more satisfactory arrangement, to accept the separate department for apparatus and pictures offered by Her Majesty's Commissioners, that such department be accepted under a protest against any classification in the catalogue of the International Exhibition which does not recognise photography as one of the fine arts."

Mr. Wall had great pleasure in seconding the resolution, in the spirit of which he fully concurred.

Mr. Borchert suggested that the word "degrading" in the resolution was rather a strong expression. Perhaps the term "improper position" would as well express the meaning.

Mr. Simpson would not abate a jot of the full meaning of the word. If a stronger word could be found he would willingly adopt it; but nothing which would weaken its force. The position assigned to photography was really a most degrading one.

Mr. Davis remarked that whilst supporting Mr. Simpson's resolution, and feeling that art-photographs are works of art, at the same time would by no means undervalue the power of photography with respect to the importance of its non-artistic applications, or admit that its results are obtained by mechanical, instead of by chemical, optical, and scientific means. He added, that for the purpose of more perfectly recognising the distinctions he had pointed out he would suggest, with Mr. Simpson's permission, the addition of the word "art" to "photography" in the last clause of the resolution; so that it might be seen that it was for art-photography a position in the fine arts was claimed.

This addition was agreed to by Mr. Simpson and Mr. Wall, and the resolution was carried by acclamation.

Newcastle-upon-Tyne and North of England Photographic Society.

A special general meeting of this society was held in the Tower, New Bridge Street, on Friday evening, the 21st inst. Dr. Pyburn in the Chair.

The Secretary read a commuuication from Dr. Diamond, Secretary of the London Society, inviting their attention to that portion of the Regulations of the Commissioners of the International Exhibition of 1862, which relates to photograph also the letter of the Right Hon. Sir F. Pollock, and subseque correspondeuce, together with the letter of Professor Playfa and requesting their opinion upon the course which, in the interest of the art, ought to be pursued. He also read the resolutions drawn up by the Council which were submitted to them for sanction, rejection, or amendment. (See last week's News.)

The Rev. Dr. Lockhart, in a long speech, said that photography could not logically and philosophically be classed as a fine art. He said it not only is not in its present state, but never can, nor ever will be a fine art. He, however, denounced the absurdity of placing photography, whether used as meaning the photographic art, or the results, (specimens) of the art in the same section as machinery. He blamed the Commissioners for not perceiviug its being really so like and so much akin to the fine arts as to be entitled to rank as next to them, and its specimen in closest proximity to theirs.

Dr. Zenner, the Chairman, G. C. Warren, Mr. Laws, and Mr. Dewar entered into a discussion on the Rev. Doctor's speech.

Ultimately, after being well sifted, the resolutious of the Council were adopted. A vote of thanks was given to the Chairman, and the meeting separated.

SECOND ANNUAL REPORT OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

In resigning the trust you placed in their hands the Committee must proffer their congratulations upon the continued advancement of the Society in public estimation, the steadily progressive increase in the number of members, the number and importance of the papers which have been introduced, and the practical, animated, and *harmonious* character of the discussions.

Nineteen papers have been read at our meetings, in which the scientific, artistic, mechanical, and manipulatory elements of photography have each received attention, as will be seen by the following list of their subjects:—

On the Adaptation of Portrait Lenses to Views, by	C. J. Hughes.
On an Improved Portable Camera ...	G. W. Simpson.
On the Photogenic Action of Colour	T. Clarke.
On Instantaneous and Composition Photography	S. Fry.
On Positive Pictures on Glass ...	A. Hervè.
On some Optical Principles Involved in the construction of Photographic Lenses	W. Ackland, V.P.

Hints on Keeping and Composition Printing	A. H. Wall, *hon. sec.*
Art Photgraphy: its Scope and Characteristics	C. J. Hughes.
On Photography in Connection with Astronomy, Meteorology, and Magnetism	T. Burr, F.R.A.S.
On the Practical Details of the Fothergill Process	F. Howard, *hon. treas.*
On Photography for Wood Engraving	J. Contencin.
On a Visit to the Photographic Department of the Greenwich Observatory	G. W. Simpson.
On Intensifying Processes as Adjuncts to Instantaneous Photography ...	V. Blanchard.
On the Stereotrope	T. Clarke.
On the Solar Camera	S. Smith.
On Sharpness	A. H. Wall.

And the first, second, and third reports of the Experimental Committee.

The Committee take credit to themselves and the Society for having recognised the importance of photography as a department of imitative art, to which the principles and rules of pictorial science are as applicable as to painting and its kindred branches. The best thanks of the Society are due to its very excellent and rev. president for regular and constant attendance at its meetings, and for the efficient character of his services as chairman during the session.

The Committee have to thank the authors of papers read at the meetings, for their able contributions, and the kind interest they have thus displayed in the Society's well-being and utility.

The thanks of the Society are also due to Messrs. Hughes, Meagher, Davis, Simpson, Leake, and others for the exhibition of apparatus, &c. To Messrs. Bayley, Fitch, Blanchard, Smith, Simpson, Joubert, Davies, Wall, and others for kindly contributing to the folio, and to Messrs. Simpson, and Davies for gifts to the Society's library.

In the Society's first annual report several suggestions were thrown out, some of which have been successfully adopted, while others yet remain dormant. Among these, the Sub-Commitee appointed for testing and reporting upon new or modifications of old processes and prosecuting experiments in furtherance of fresh discoveries has been very happily carried out. The out-door meetings then suggested have also been adopted with general satisfaction to the members.

The Committee cannot permit this opportunity to pass without recording their grateful thanks to the following gentlemen, viz., G. Wharton Simpson, Sebastain Davis, Jabez Hughes, Borchert, and M. Hannaford, for their punctual and regular attendance, and their generous and valuable labours as members of the above Sub-Committee.

In entering upon the new year your Committee would suggest that the Society enter upon a new condition of existence for the following reasons:—

When the subscriptions of members have been used for the expenses incurred by the Society, for the Journal, and for the presentation print, it is found that the trifling balance remaining is not sufficient for the incidental expenses of warming and lighting the rooms, correspondence, &c., and that any thought of devoting small sums to the prosecution of experiments, or to other steps in connection with the advancement of the art, and, consequently, of the Society, would have to be completely abandoned.

To meet the above difficulty two paths were open. In the one, the subscriptions could be raised to a guinea per year, or an entrance fee, such as is usual in similar associations, be established. In the other, the Journal might be abandoned, and one subscription of half-a-guinea be adopted; the society pledging itself either to spend more money on the presentation photographs, or to increase the number of such, so as to secure two or more per year for each member.

Thinking the latter the better plan, your Committee recommend its adoption.

Another consideration in connection with the supply of a Journal, was, that in undertaking such distribution to members, the Society rendered itself responsible for the subscriptions of such, although the Committee could not always rely upon the receipt of the same from *all* the members. For instance, in several cases, last year's subscription remain unpaid up to the present time; and in one case the Journal has been supplied to a member for the two past years of the Society's existence, whose subscriptions, after repeated applications, also remain unpaid.

Influenced by the above, and thinking it wrong that the Society should be in debt to its officers, your Committee was contemplating the discontinuence of the Journal, when an event occurred which helped them very summarily to a conclusion.

The Publisher and Editor of *The British Journal of Photography*, placing an interpretation upon the connection existing between it and the Society, never directly or indirectly accepted by your Committee, and claiming certain exclusive privileges tending to cripple the independence of the Society, and retard its influence in propagating and advancing the art; such claims were not admitted, and an engagement made for a term with the Publisher, was, in consequence, by him, abruptly broken, although the Committee, resolving that their engagement to the members should be more justly carried out, procured the Journals at an increased rate of charge, and forwarded them post free as usual.

In consequence of this misunderstanding the hitherto pleasant connection between this Society and the *British Journal* has ceased. We can no longer be regarded as associated in any way with the trade interests of any particular periodical, and each member may select for himself such journal as best pleases his own taste or judgment, while by supplying at least two presentation prints per year, and rendering the Society even more actively useful in new departments, we must endeavour to fully compensate our members for what might otherwise be regarded as a something lost. We trust, therefore, that the support the Society has hitherto received, and we may fairly say *deserved* also, will not be withheld, and that the conduct of the Committee in supporting the proper dignity of their position, will give satisfaction both to the members and the friends of the Society.

The Committee, moreover, recommend that, instead of one, three Vice-Presidents be appointed; and that in addition to Mr. W. Ackland,* our present vice-president, they have received permission from Mr. Sebastian Davis, and the Editor of the Photographic News, Mr. G. W. Simpson, to nominate them for election, a step which we are sure will be thoroughly appreciated by the members generally, and do honour to the Society.

The Committee recommend that the following gentlemen be elected to serve on the Committee of the next year.

Messrs. Hannaford, Fry, Borchert, Blanchard, Quentery, Hughes, and Leake.

And that the Secretary and Treasurer be re-elected.

Also, that the following gentlemen be elected as members of the experimental Sub-committee:—

M. Hannaford.	W. Ackland.
G. W. Simpson.	Saml. Fry.
J. C. Hughes.	F. Howard.
Sebastian Davis.	M. Borchert.

It is usual to wind up annual reports with a glance at the progress made by the art during the society's year. This need not, however, prove a very tedious task, inasmuch as the fact is that no very prominent discoveries, or other important features have marked the history of photography since our last annual meeting. The vexed question of government competion with photographers had its day and seems likely to give place to a scheme for organizing an association which, if successful, will compete with the professional photographer through the aid of amateurs, more

* Mr. Ackland sent in his resignation before the meeting.

effectually, perhaps, than even the Government grant enables the South Kensington Photographic Department to do. The leisure of wealth, and the skill of labourers independent of their hire, who are satisfied with any remuneration which will pay even for the bare material, being rather formidable antagonists to that other labourer whose work buys *daily bread as well as the bare materials.*

Some promising steps have been taken in the adaptation of artificial light to photographic purposes. A good many firm-placed steps have indicated progress in an artistic direction. Modifications of more or less value in existing processes have been brought forward. Photolithography and photozincography have moved towards perfection.

Panoramic photography now appears to have made a fresh start. It is to be regretted that too many of our best and most artistic photographers—forgetting that upon such expositions the public estimation of their art is founded—sent nothing to the Photographic Exhibition of London (which was not, in consequence, so fair an exponent of progress, especially artistic progress, as it might have been). The Architectural Photographic Exhibition was a very excellent one; and of this, we are happy to add, no such remark as the above could be made. A new process, which will enable us to dispense with a sensitizing bath, has been announced as an idea conceived by Captain Dixon, and worked out by a member of this Society, Mr. Fry. Several other gentlemen, however, have laid claim to the idea, Mr. Bellini having previously announced the same in the Photographic News.

In conclusion, the Committee feel it their duty to proffer some remarks in connection with the position photography will probably hold in the Great International Exhibition of 1862.

This grievance is too well known to be here repeated; but every Photographic Society in the kingdom ought certainly to combine in suggesting, discussing, and preparing for such steps as may most vigorously oppose and defeat the foolish, unjust, and mischievous intention announced by Her Majesty's Commissioners of classifying pictures produced by optical and chemical science and artistic talent under the head of—heaven save the mark—Machinery!!!

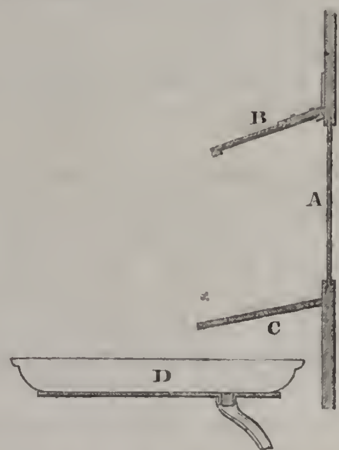
The following are the modified rules proposed for adoption:—

1. That this society be called the South London Photographic Society.
2. That this Society hold its meetings on the second Thursday of every month, to read papers upon photography in any of its various departments, and discuss the same; to prosecute experiments, exhibit apparatus and specimens, &c.
3. That nine in-door meetings be held from October to June inclusive, and that out-door meetings, as may be appointed by the Committee, be held during the three intervening months.
4. That the number of members be unlimited; and that all candidates for admission be nominated by one member, seconded by another, and elected by show of hands.
5. That ladies be eligible to become members.
6. That every member be privileged to introduce a friend at the monthly meetings.
7. That the subscription be half-a-guinea per annum, *payable in advance*, and a payment of five guineas in one sum, constitute a life member.
8. That the Committee be empowered to arrange soirées, conversaziones, exhibitions of photographs, appoint Sub-committees for conducting any particular series of experiments &c., as the Society's funds may permit.
9. That no member be deprived of his privilege unless by a vote of three-fourths of a special meeting.
10. That the annual subscription be due upon the second Thursday in June, at which meeting officers are to be elected for the ensuing year.
11. That the management of the Society be conducted by a President, three Vice-Presidents, Secretary, Treasurer, and a Committee of eight; four to form a quorum.
12. That a full report of the Society's affairs be laid before the members at the annual meeting.
13. That the Secretary have the power of convening a special meeting on receipt of a requisition signed by half-a-dozen members.
14. That no alteration be made in these rules except at the annual meeting in June, or a special meeting convened for such purpose.

Apparatus.

AID TO DEVELOPMENT.

Sir,—I have lately made an addition to my dark-room window which enables me to develop the negatives and positives with much greater certainty and ease than before; and as it is easily applied to almost any dark-room some of our readers may like to try it also.



A is the yellow-glass window of the dark-room, 11 × 9 inches; B a peice of looking-glass, 11×6 inches, fitted into a slight wood frame and hinged to the wall of the dark-room; C is a piece of slate painted white, 11×6; D developing tray. The glare of light coming in at the window is thus shielded from the eyes and from the plate; and being reflected on to the white slate it is much easier to see when the negative is developed to its proper depth.

For clearing silver baths I have found common washed whiting to answer better than kaolin, citric acid, or chloride of sodium.—Yours truly, Thos. Gulliver.

17, *Heathfield-street, Swansea.*

WOODEN BATHS FOR THE SILVER SOLUTION.

The use of wooden trays for the various solutions used in printing has often been advocated, and operations on such an extensive scale as that rendered necessary by the solar camera, render them little less than a necessity; but the use for wood to hold a nitrate bath for collodion plates has not been tried to any great extent. According, however, to some of the writers in the *American Journal of Photography*, they are likely to come into general use amongst our cousins in the States. Mr. E. K. Hough, writing on the subject, remarks:—

"The veriest tyro in chemistry must know that the most essential qualities of the bath should be its perfect neutrality to the nitrate solution, neither affecting it nor being affected by it. And among all the materials used, including gutta percha, rubber, earthenware, glass, porcelain, &c., I believe there are none that excel a well-made wood-bath, lined with shellac, in the combined qualities of strength, durability, shape, and lightness and convenience of handling for the purposes intended, and last, but not least, the low price for which it can be constructed.

"I know of several operators who are using wooden baths, and I am now using one that takes a plate 14 × 17ins., made of common well-seasoned inch pine plank, with strips on sides and bottom 1½-in. square, closely set with tongue and groove, and all strongly held by large screws 2 inches apart, leaving the chamber for the solution 16 × 21½ins.; this bath was coated with shellac six months ago, and has been in active daily use since, without the slightest apparent depreciation of either the solution or the vessel itself. In that there have been added several pounds of silver and gallons of water without any tendency to fogging or any other morbid action, nor has it been necessary to add a single drop of either acid or alkali, and the solution now remains as clear as water, which is more than I could say of many other baths I have used except glass. One end of the bath is hollowed under, like the nose of a pitcher, and the contents can be turned from it as readily, without losing a drop.

"This bath only cost the modest sum of four dollars, which was high at that, while most of the good baths in the market of that size would cost from twelve dollars to twenty-five dollars. Such a bath can be constructed at very short notice in the most retired village, and might be remembered to advantage by those country operators, whose present bath should surreptitiously give way, from accident or old age, without due notice, thus leaving them sadly in the lurch.

"And I would recommend all operators who think of getting new and larger baths, to visit the most careful and ingenious carpenter in their vicinity, and engage him to construct a vessel for two or three dollars, and turn into it a quart or so of shellac, a little more fluid than mollasses, and when it is well coated all over, to turn off the surplus, and leave it until thoroughly dry. Then he may turn in his best negative or positive bath solution without the slightest fear of evil consequences; occasional drying and shellacing is of course advisable, but unless it leaks is rarely necessary."

Mr. P. C. Duchochois, writing on the same subject, remarks:

"As wood for silver baths is likely to come into general use we should determine the best method of constructing them. I offer a few hints on the subject, partly from actual experience, and partly from consideration of the nature of the materials with which we work.

"The wood should be thoroughly seasoned, in order that the pores may be open to receive the shellac; the gum must be allowed to penetrate the substance of the wood far enough to take hold of the fibres. In order to have the wood free from injurious matters contained in the sap, it might be worth while to give it a good soaking in running water, finally drying it by artificial heat if necessary.

"The matching of the joints should be truly made, and thick varnish be used instead of glue. When iron screws are used they should be so placed that the solution cannot in any way reach them; the heads should be sunk in and well varnished.

"After the bath is put together, it should be filled with thin shellac varnish, and kept so for a day or two. The varnish being thin will penetrate the wood and saturate it thoroughly. When the thin varnish is poured out it may be replaced by a varnish thick enough to give a suitable glazing. If very thick varnish be used at first there is danger that it will crack and scale off on becoming dry.

"Pans for silvering paper or salting, may also be made of wood, which will be found as serviceable and far cheaper than of materials commonly used."

The method adopted by Mr. Francis, of working in a thin sheet of pure india-rubber as a lining to a wooden bath, must, we apprehend, be simpler in application, and more satisfactory in result than a mere varnish of shellac, which must be constantly liable to chip and abrade from contact with the edges of the glass and the bottom of the dipper. We intend shortly to try one of the india-rubber lined baths, and report upon it.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 26th June, 1861.

The competition for the Duc de Luynes' prize of 2000 francs for the perfecting of the positive printing of photographic proofs, either by old process, or by new carbon processes, will close on the 30th instant. The decision as to the other prize of 8000 francs for converting positive pictures into plates which will serve to yield a large number of proofs by the processes by which engravings or lithographs are produced, without the intervention of the human hand in the design, has been postponed until the 1st of July, 1864.

Photographers will perhaps need to be reminded that the Exhibition of the Industrial Arts, to be opened at Brussels on the 1st of August next, will include a section specially appropriated to photography. Pictures intended for exhibition must be sent previous to the 5th of July next, and notice of the same previously to M. Dulieu, Secretary of the Association of Industrial Arts, Palais Ducal, Rue Ducale, Bruxelles.

Another Photographic Exhibition will open in September next, at Marseilles, under the direction of the Photographic Society of that city, the secretary is M. Lion Vidal, Rue Mazagran, 2, a Marseille. Pictures now in the Paris Exhibition can be forwarded direct to the Marseilles Exhibition, by addressing the secretary of the Paris Exhibition to that effect.

M. l'Abbé Laborde has addressed to our photographic Society the following communication upon the action of iodine in the silver bath.

Generally, we endeavour to give the greatest possible sensitiveness to collodion film, and one of the most efficacious means of so doing consists in employing a silver bath saturated with iodide, and quite neutral. But this neutrality exposes us to another evil, which we inevitably fall into, if, at the same time, we direct all the other operations towards extreme sensibility; a general veil or *fog* covers the proof, and shows itself principally on the *reserves*. The *reserves* are those parts of the proof upon which the light has not acted; this term will be found very convenient, for it designates without confusion similar effects by the same word, the *whites* of the negative proof and the blacks in the positive upon glass. We must, therefore, resign ourselves to the loss of some sensibility, either by modifying the whole of the processes, or in giving to the silver bath a slight acid reaction.

M. Laborde has found a new method easily put in practice, and which, in preserving the same degree of sensitiveness in the collodion film, gives also great purity to the reserves. This method consists in introducing some iodine into the silver bath saturated with iodide of silver; about 1 part to 200 parts of liquid. The bath is shaken from time to time; and after a contact of four-and-twenty hours, a silver bath which has caused the negative to fog will have become regenerated, so to speak. We cannot apply the ordinary laws of chemistry to this fact; or, rather, we must search deeper into these laws to find an explanation of it. For every chemist will think that iodine in contact with nitrate of silver will remove the silver, and set some nitric acid free; this acid would then act like most other acids, in opposing the reduction of the silver upon the reserves. But it is found that the prolonged contact of iodine with the silver bath, well saturated with iodide of silver, does not cause it to lose its neutrality; the nitrate bath containing iodine may be heated nearly to ebullition without manifesting subsequently any acidity. We can employ this means if we wish to obtain in a few minutes the whole effect of the iodine upon the silver bath.

However, when the iodine has remained fifteen to twenty days in the bath, a yellowish tint may be observed on its surface: the liquid then possesses, sometimes, a slight acid reaction; but this tint has a secondary action, which must be attributed to air dissolved in the silver bath. The yellow tint manifests itself by lineaments which correspond to the grains of iodine where the imprisoned air has been drawn into the liquid; and if we see a bubble of air fixed on the surface of the iodide, we may observe subsequently that it has disappeared. and become replaced by a yellow spot. In making the experiment in a flat plate, inclined so as to put the iodine in contact with the air and the liquid, some iodide of silver will be formed around the fragments of iodine, and the bath will lose its neutrality. From this we may understand that the iodine must be entirely immersed in the liquid, and that it is best to withdraw it when it has produced the desired effect. It is easy to restore the neutral state of the bath by adding some carbonate of silver. We can even leave an excess of carbonate of silver in the silver solution, without its losing any of the properties it owes to the presence of iodine; this fact proves still more that they are not due to nitric acid, else we should have to admit the existence in the body of the same liquid of the prolonged existence of two substances which mutually attack each other. Besides we know that the feeblest proportion of nitric acid diminishes much of the sensibility; and if the dose be a little strong, the proof becomes flat, because it refuses to strengthen under the developing agent. When the nitrate of silver is not saturated with iodine, matters proceed differently: the iodine removes some silver from the nitrate, and sets some nitric acid free: the iodide of silver dissolves in the silver solution, which soon becomes very acid. We can neutralize it by carbonate of silver, but it is much better to dissolve the iodide of silver in the nitrate, and add the iodine only after complete saturation.

The effect of iodine in the silver bath consists, probably, in preventing that spontaneous reduction upon the sensitive film which often takes place without the luminous action. The silver reduced in advance called afterwards the reduction of the nitrate under the developing agent, without any well marked preference for the impressed parts when the first reduction has been rather strong, a general *fogging* results, which really does not cover the image, as it pre-exists, and is formed as promptly as the image. We see by this how important it is to prevent this veil or fog.

In this modification of the bath, it is remarked that the proofs solarize with difficulty; to do so, they would require much longer exposure than ordinary. Solarization is doubtless very often attributed to the subjacent veil spoken of above, then we diminish the time of exposure; thus by pursuing a false route from which we can only emerge with mediocre proofs in our hands.

Photographers have long known that we must almost always attribute to the silver bath the imperfections which torment them so keenly by the obstinacy with which they reappear; in iodine will be found a powerful auxiliary for avoiding most of them.

DEPTH OF FOCUS.

"Who shall decide when doctors disagree?"

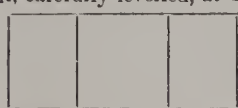
SIR,—It is a fact which seems often forgotten by the "scientific" gentlemen who occupy most of the time at the meetings of the Photographic Society that the extremely animated discussions with which they favour us will not alone suffice to illustrate the powers of photography. "Palabras! Palabras!" as the Spaniard says, whence Palaver—mere words, whether fair or otherwise—butter no parsnips. I often think it would be much more to the purpose if they did more and talked less. The practical result—without which the art would remain an optical and chemical theorem—is—a picture, and it appears to me that the "scientific" ideas respecting "depth of focus" recently advanced tend considerably to puzzle those who, wanting to produce the picture aforesaid, trust at the same time to their oracular dictates.

I maintain that there is such a quality as "depth of focus," and that it is of the most essential necessity to the production of the photographic picture.

"Focus" I take to be the point of most perfect definition in the delineation by the photographic lens of a subject or object; but this mere point or line to which we are to be tied down is, under certain conditions, capable of extension, relatively or absolutely, in the subject, and then I consider the term "depth of focus" correct.

To illustrate my assertion:—at the full aperture of a 6-inch double lens of long—say 24 inch—focus, the point *a* being focussed, the shallow line of correct definition traversing the object or subject is in immediate contact with buzzy indistinctness, which may be theoretically scientific, but which, in practice, is artistically hideous. If we now diminish area of aperture by a stop to 5-in. diameter, we find that not only *a* is well defined and "in focus," but
— *e* that *b b* leaves the buzzy haze and appears also defined.
— *d* Putting in 4-in. stop, *c c* are as good as *b b*, with the
— *c* former; 3-in. aperture will relieve *d d* from its ob-
— *b* scurity; whilst 2-in. will give a condition of *printed*
— *a* *picture* in which the mathematical LINE, which was
— *b* the appearance presented, has been deepened and
— *c* extended in such a manner that for all practical
— *d* purposes it includes with equal goodness of definition
— *e* to *c c*, whilst the drawing of the most extreme points
is relatively ameliorated.

Or otherwise, taking six lenses of the respective focal lengths of 18, 15, 12, 10, 6, 1½, and, focussing each upon *a*, we observe that 18 inches only gives a *line* correctly, but that 1½ includes the two extremes, and that pro rata of diminution of focal length in our lens, we have more and more depth of focus in our subject. Now it appears to me that if there is no perceptible difference in the definition, or "sharpness" in the picture, of two objects situated in different planes in nature that the term "Depth of Focus" is a very legitimate and proper one to express the quality described. Nor, in my experience, is it at all a necessity that possessing such a quality should be indicative of faulty correction, for spherical or chromatic aberration in the lens. Ecce signum; I have a 4½ double lens by the late Andrew Ross, 13 inches focus to parallel rays; at *full aperture* I point it, carefully levelled, at 18 feet distance on the window of



my dining-room, and on a 12 + 10 plate the result allows a straight edge to prove the perfect and exact square and *truth of the lines*. I have many quasi and *absolutely* instantaneous pictures, some of the latter 12 + 10 in size, showing its *rapidity*, whilst the certainty of its best definition, being precisely that sought for, shows in the result that the chromatic aberrations have been perfectly corrected. Practically, I cannot call such a lens other than very perfect for the multiplicity of uses to which I have had occasion to put it.

Considering one iota of tangible result worth any amount of "Palaver," I send you, in proof that there is such a quality as "Depth of Focus" in a *good* (the before-mentioned) lens. A trial plate taken just before a recent public ceremonial; you perceive 10 + 8 size of picture, 3 inches aperture, on 4½; time, 4½ p.m. on a rainy, dull day, as the umbrellas show; exposure, *two seconds*. Referring to the printed placards, which happen really to form quite "a test for a lens"—you perceive that the definition is absolutely equal in those in the foreground, and in those behind, although not less than 100 feet of distance intervene.

Surely, sir, this is "Depth of Focus," if not, I should like to have a scientific denomination, which would better describe the quality.—I remain, your obedient servant,

LAKE PRICE.

[The proof forwarded unquestionably confirms the position assumed by Mr. Price. The letters on placards in the foreground and furthest distance, including a range of 100 feet are perfectly legible. The print illustrates what we meant in our last week's article by the term "sufficient definition," although it is possible that cavillers on the opposite side might say there was no perfect or microscopic focus at all. Those who know the late Andrew Ross's lenses will understand, however, how to regard such an objection.—ED.]

Talk in the Studio.

Photography by Machinery.—A very elaborate specification has been published detailing the particulars of a process for the rapid re-duplication of photographic proofs by the aid of machinery, the invention of Mr. C. Fontayne Flounders of Liverpool. The sensitive paper revolves on a roller under a negative, tho light upon which is concentrated by means of a condenser. Tho method of printing by development is adopted in connection with this invention.

Exhibition Medal.—Mr. D. Macliso has received instructions from tho Royal Commissioners for the International Exhibition of 1862, to prepare a design for prize medal.

Photozincography.—A fac-simile of a portion of the Domosday Book MS., relating to Cornwall, has been just completed by Col. James at Southampton, and is ready for issue to the public.

"Light" in the Sea.—Dr. Wallich, in a recent paper on Nature of tho Deep Sea Bed, read at the Royal Institution, says: "Light, or rather the absence of it, can hardly bo said to determine, in any important degree, tho distribution and limitation of the lower forms of animal life. Light is not essential even in the case of some of the higher orders. A largo class of creatures, both terrestrial and marine, possess no truo organs of vision, although there is good reason for believing that they do possess somo special sensory apparatus, susceptible to the influence of light; whilst certain creatures, whose habitation is in subterranean caves or lakes, as in tho Magdalena caves, near Adelsburg, and tho Great Mammoth cavos in Kentucky, either possess no organs of vision, or possess them in so rudimentary a state, as to prove clearly that the absence or imperfect development of this sense may bo compensated for by the higher development of other senses. It is quito impossible at present to say to what depth light penetrates in tho sea. Tho photographic art will, no doubt, one day solve the problem. But it is almost certain that a limit is attained, and that, moreover, long before the deep recesses guaged by tho sounding machine are reached, where the light-giving portion of the ray cannot penetrate even in tho most attenuated condition; and yet, as shall hereafter be shown, creatures have been found down in those profound and dark abysses whoso colouring is as delicato and varied as if they had passed their existence under the bright influence of a summer sun!"

The Camera v. the Rifle.—The *American Journal of Photography* states, that at the recent meeting of the American Photographic Society, a corporal's guard of members only turned out, and after transacting tho routine business, dissolved at once, that they might form themselves into squads to discuss the state of the war.

To Correspondents.

M. M. D.—There is very great risk of injuring an unvarnished negative in printing transparencies by superposition of a wet plate, however carefully the plate may be drained. For such a process the negative should be well varnished. If you do not wish to varnish the negative by camera printing.

A. F.—Very few quarter-plate lenses will produce standing portraits of the carte de visite size with anything like success. Sitting figures are more easily managed, as the position of the figure is more easily adapted to the curved field of the lens. If you have length of room enough, use a half-plate lens, if not, procure one made expressly for the purpose in question. 2. See an article in our last number, on this subject, by Mr. Eliot.

S. G. E.—We cannot tell you with any definiteness the prices charged for enlarging with the solar camera. They vary abbording to circumstances. We believe, from about half-a-guinea to a guinea.

Thos. Smith.—Whey is made by adding rennet, which is the preserved stomach of the calf, to skimmed milk. It may also be made by adding acid to milk. Perhaps the best method of preparing it for photographic purposes, where it cannot be procured ready, or where the rennet is not at hand, is by means of lemon juice, about two tablespoonfuls to a quart of skimmed milk. This should be boiled, and the curd removed by straining through linen. This is the method to which you refer as recommended hy Mr. Sutton. An article on the benzole waxed paper process recently appeared in our columns. A resumé of the Rev. J. Lawson Sisson's "Turpentine Waxed Paper Process," as given in the pamphlet published by Marion and Co., appeared in our second volume, p. 277. We havo seen some most exquisite results produced by it.

G. G.—In French polishing the finishing polish with a little spirit alone may be dispensed with if you choose. Its object in the hands of those who are skilled in the manipulations is to give a higher and more perfect polish than had been attained in the earlier operations. It requires the application of very little spirit, and a light and skilful hand. The subject of republishing the "Amateur Mechanic" has not been forgotten. It will have additional chapters on polishing &c., when it appears.

Very Troublesome.—Your negative is not nearly sufficiently dense. Get a much denser negative, and print much deeper. You cannot print deeply without a negative dense enough, and without sufficiently deep printing you cannot effect much in the way of toning. Your negative is not sharp; always focus for the eyes.

F. J. G.—Two or three grains of gallic acid to the ounce of water will do for the final application to Fothergill plates. We continue to hear very good accounts of the results. Letters intended for answering in the same week's News should never reach us later than Thursday morning, as we go to press on the evening of that day. Yours reached us on Friday, after last week's paper was printed.

Perseverance.—The terms "negative" and "positive" as applied to different qualities of paper had their origin when the calotype process was more in vogue. The negative paper was the thin fine paper suitable for producing paper negatives, printing more rapidly, and showing less of the texture of the paper than the thick papers. The terms are still sometimes used as descriptive of the papers, even when intended simply for positive prints. What is termed negative paper is generally preferred for stereoscopic prints. 2. We see no reason why the pair of lenses you have should not answer for stereoscopic views if the focus and action of each is the same. Being portrait lenses you must use a central stop to make them available for views. If you use a plate seven inches long you can place the lenses any distance from 2½ in to 3½ in. apart. It is sometimes convenient to have a lateral movement so as to be able to vary the distance slightly.

Tannin.—Either 2 or 3 are good; perhaps a mixture of the two will prove best.

R. C. R. B. J., India.—The iodizing solution you use is very good, but you would probably find an advantage, in an Indian climate, in the entire use of iodide of cadmium or the substitution of iodide of sodium for iodide of potassium. You will be able to obtain the alabastrine solution of Messrs. Le Page and Co. You will have already seen that we have published all that is known of the process of Mr. Bellini. The albumen process is only used for landscape purposes or transparencies. Collodion is better for portraits, although we have heard, as you state, that Signor Beato took portraits on albumen in India. We prefer a twin lens camera for stereoscopic pictures, whether portraits or views. Calico, painted dark grey, is the best for a background. The redness and thinness in your negatives, when over-exposed, is due to what is termed solarization. The best remedy is the addition of citric acid to the developer; about half a grain to each ounce of solution. Your collodion losing its colour, after first being dark is not necessarily a defect. We see no reason to believe your silver bath in fault. The formula of Powell's collodion is known only to the makers. Many of your questions have been recently answered, and articles on the subjects you inquire about have been recently published in our pages. We recommend you to procure Hardwich's "Manual of Photographic Chemistry."

C. F. E.—Negatives, intensified by means of bichloride of mercury must be varnished. It is not absolutely necessary to varnish negatives produced in the usual manner, except for their protection. Varnishing sometimes slightly reduces the intensity.

Tit Tat To.—The collodion is most probably in fault. Try another sample, or add a little of an older collodion to it. The gallic acid solution would probably answer your purpose. A two or three grain solution may be used, and is poured over after all the other operations are completed, and left to dry without further washing. The chloride of ammonium in the albumen solution gives greater certainty of freedom from stains, but sometimes diminishes the intensity a little. Negatives from dry plates, if they are full of detail, as you describe, but are wanting in force, may be intensified with bichloride of mercury, the same as negatives by the wet process.

J. T. Barber.—The process will be published shortly.

F. G. Jackson.—Your nitrate bath has far too much free nitric acid for negatives, one drop to the ounce is a full dose, even for a positive bath. Add a little oxide of silver, which will be converted into nitrate of silver, and thus remove the free acid and strengthen the bath at the same time.

John Picken.—Pure whites and deep blacks in glass positives depend upon all parts of the process being in proper relation, rather than on the developer only; but the addition of nitric acid to the developer, about one drop to the ounce, generally improves the whites. To begin at the beginning: use a strong nitrate bath not less than 35 grains or 40 grains to the ounce, and a drop of nitric acid for each ounce of solution. Use a strong-bodied collodion made from pyroxyline at a low temperature. Develope with a mixture of protonitrate and protosulphate of iron, made as follows: dissolve 1 ounce of powdered nitrate of baryta in 16 ounces of water, add 2 drachms of nitric acid. Then add 1½ oz. photosulphate of iron, and shake the whole till it is dissolved. Then filter carefully to get rid of the white insoluble sulphate of baryta which is formed. The solution loses its strength if kept long; this may, in some degree, be remedied by adding from time to time, as it gets weak, a little more protosulphate of iron. Add sufficient alcohol to make it flow freely. A few drops of tincture of iodine in the collodion help to keep the blacks clean. Carry out these hints, and you will get rich positives with pure whites and deep blacks.

R. Elgie.—The stains are not caused by the mounting. They appear to consist of the insoluble hyposulphite of silver, and most probably occur from nitrate of silver coming in contact whilst hyposulphite of soda remained in the print, or from hypo coming in contact whilst silver was in the print. The insoluble hyposulphite of silver once formed in this way is never removed, it does not show much at first, but gradually darkens to a dirty greenish brown.

J. A.—The streak in your print arises from the paper. It is difficult to say whether it is from some fault in the original paper, or imperfect albumenising.

N. H. W.—We do not quite understand your description of your intended glass room. After stating the dimensions, you say "there will be two feet of woodwork at the end where the sitter will be, and twelve feet from that in length at the sides and top." Twelve feet of what? Send us a rough diagram in your next, and we shall have pleasure in giving you our aid in the matter. Try the addition of a few drops of tincture of iodine to your collodion, or a little more acid in your bath.

*** Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 148.—*July* 5, 1861.

M. ROMAN'S MODIFIED TAUPENOT PROCESS.

It will be interesting to those of our readers who already practise the collodio-albumen process, and are anxious to produce the rapid results referred to in M. Chevalier's pamphlet, to know that they may do so with their plates prepared in the ordinary manner; the only modification in the usual practice being the use of a hot developing solution.

One of our correspondents, a gentleman who has had very large experience in the dry processes, informs us that he has recently made some experiments on M. Roman's process, full details of the results of which we hope shortly to receive. He has already arrived at conclusions which justify him in believing that in the use of the hot developer the true source of the rapidity exists. A plate prepared by the collodio-albumen process, as he usually practises it, was exposed for three seconds with a Ross's stereo single lens, and then developed with a hot solution of pyrogallic acid, and was found sufficiently done. For the satisfaction of those who may wish to repeat the experiment, we may briefly state the method adopted by our correspondent in the preparation of his plates. A bromo-iodized collodion is used, and after exciting, the plate is first washed in a dish of distilled water, and then thoroughly in common water. It is then coated with albumen containing chloride, iodide, and bromide of ammonium. The final exciting bath contains thirty-five grains of nitrate of silver, and thirty minims of glacial acetic acid to an ounce of water. After exciting, it is well washed; and after getting rid of all free nitrate, is coated with a two-grain solution of gallic acid, as originally suggested by Major Russell; the plate is then dried.

We hope in the course of a week or two to publish the results obtained by our correspondent more at length. In the meantime we shall be glad to learn if any other of our correspondents have been experimenting in the same direction, and with what success.

PHOTOGRAPHIC EXHIBITION AT MANCHESTER.

The Manchester Society is resolved to take time by the forelock, and has, some weeks ago, issued a prospectus—which, by the way, from some singular oversight of the secretary, we presume, never reached this journal—of an exhibition intended to be held in connection with the British Association for the advancement of science, the meetings of which have to be held in Manchester in September next.

The committee formed for the purpose of carrying out the arrangements propose to organize the exhibition upon a plan which they believe has not hitherto been attempted, and solicit the aid of all interested or accomplished in the art, to assist them.

"Photography," they observe, "is no longer an art which merely gives us interesting pictures in landscape and portraiture; nor is it a fixed thing, conducted upon one set of established rules, for we now find it applied to a large number of objects and uses, and conducted upon many methods differing materially from each other. It is particularly the aim of the present undertaking to show its capabilities in these respects. At a gathering like that of the members of the British Association, men of all shades of taste and acquirements in scientific pursuits are brought together, and it is thought that by making the proposed exhibition the means of showing how photography may be applied to their several pursuits and requirements, that a great end will have been attained; not only by affording amusement for the time, but by gaining a more extended patronage of the art, and securing the co-operation of many who are at present totally unacquainted with the wide field of subjects to which it may be made subservient."

The objects of the committee are decidedly laudable and worthy of the aid of photographers generally. We would suggest, however, to the committee that they scarcely best serve the purpose for which they are appointed, by neglecting, either of intention or otherwise, to avail themselves of every means of publicity open to them.

It is proposed to classify the specimens exhibited, somewhat after the following method :—

I. Present state of the Art, as illustrated by views, portraits of eminent persons, &c.

II. The Practical Application of Photography to copying machinery, maps, paintings, statuary, rare engravings, geological strata, &c.

III. The various applications to engraving, lithography, wood cutting, &c.

IV. The History of the Art, as shown by some of the early efforts of Daguerre, Talbot, Archer, and others, with specimens of the various processes, such as Daguerreotype, calotype, wax paper, collodio-albumen, &c.

V. Various experimental processes, such as prints with uranium, platinum, carbon, &c., and numerous curiosities in Photography.

VI. Photographs with the microscope and telescope.

VII. The most recent improvements in Apparatus.

It is submitted, that not only photographers, but those also who merely take an interest in the Art, may assist the Committee materially in more than one direction. Those who do not themselves work at photography may possess and be willing to lend the productions of others, or to canvass their friends for choice or peculiar specimens of the Art, and all may assist by encouraging an interest in the Exhibition, and by affording hints or counsel as to the practical carrying out of the design.

A detailed scheme of the rules to be observed by exhibitors will be issued in due time.

ART PHOTOGRAPHS.

We have received from Messrs. Jackson Brothers, of Jumbo, near Manchester, specimens of a series of photographs in the Medlark Valley.

Than these we have seen few photographs more pleasing to the artistic eye. The subjects are of the more familiar and common-place kind: the homely features of a country lane, and such scraps of village life as one might gather in plentiful abundance, during a summer afternoon's ramble on many a country road, constituting the elements out of which, by attention to the rules of art, and careful photography, these very excellent pictures have been created. Such subjects as the Dutch masters of painting delighted in seeking are here shown to be as valuable to the photographer as to the painter, while the careful imitation of texture and detail is as characteristic of photography as of Dutch painting.

Nearly all these landscapes have figures introduced, and, with one exception, these are exactly in the right places, doing just their proper work as elements of composition, and strengthening the sentiment or feeling of the whole. Let us glance over this charming little collection.

The Milk-boy's Return.—In a narrow rustic lane, dappled with sun and shade, we see a milk boy jogging leisurely towards home with his milk-cans and donkey; a child has paused to rest by the way; and a distant figure is approaching in the same direction. They are all coming one way, doubtless towards some town or village; at any rate this is the suggestion, and such a suggestion is of no small value to the picture, which is a most charming one.

Red Bill's: Daisy Nook.—In the picturesque porch of an otherwise modern cottage, sits a contented-looking fellow, placidly enjoying a pipe, while two other figures, a male and female, rest upon the low and dilapidated wall in an attitude suggestive of a cosy chat. A third figure in the background leans over a gate. It is evident that work is over for the time being, and that rest is a very enjoyable luxury. Grouping, posing, lighting and tone all suggest repose.

Watt's First Engine.—A boy bearing his satchel from school comes up and stands in an attitude expressive of earnest thought before the picturesque ivy-grown old relic of "Watt's first engine." The straight line of a very unpicturesque hill cuts the picture near the top, and a straight row of angular brick and tile cottages, each with two windows and one door, and every window and every door exactly like each other, is on the right. But, nevertheless, this, like the rest, is *a picture*, pleasing at a glance those who know nothing about composition, and pleasing yet more, after a long look, those who know all about that sort of thing.

Ancient Cottage, A.D. 1410.—The gable end of a very picturesque ancient cottage. Milk-cans on the right, other domestic utensils on the left; a yard paved with what have been termed "petrified kidney potatoes," and overshadowed with trees; a group of three figures, as essentially belonging to the milk-cans and kitchen utensils, as the latter do to the cottage; and there, too, is a picture, which brings a smile to the lips of the most common-place observer, as they part, in uttering, "Bless me, how natural!"

The Ware: Daisy Walk.—A foreground, formed by a picturesque female figure about to wade into the water; other figures leaning listlessly over a rude rail, and watching a narrow stream tripping over rugged, irregular steps of stones, after emerging from a dark arch; yet other figures, engaged in conversation, a fine group of trees, some distant cottages, and again other trees beyond. These constitute the picture, and it would astonish the uninstructed observer could the figures be removed to see how much of the picture's real interest belongs to them. One figure, bye-the-bye, is badly placed. It is that of a seated boy, backed by a dark shadow, the boy's face is the lightest, the shadow is the darkest part of the picture, and the two thus brought into immediate contrast form a focus just where such a focus has no right to exist. This is the one exception above-named, for the boy occupies just the position on the one side that a man's figure fills on that exactly opposite. The oval shape, the breadth, unity, and clearness of the whole is charming. As to that obtrusive boy, we no sooner saw his patch of a white face than out it went behind a dab of crayon which lay at hand, and we sighed a sigh of great relief to find it "gone from our gaze."

Medlark Valley Farm is a farm-house, and a quiet valley leading thereto, with a couple of rustic figures sauntering along it. These figures, although not badly placed or obtrusive, are the only ones in the whole series which show that they have been placed, and look conscious of "being taken."

We have thus pointed out the subjects of which these very artistic photographs were created—subjects within every one's reach—in order to impress upon our readers the importance of pictorial rules as elements of the picturesque. When they first reached us we were at home, and in the company of friends; professional artists, professional photographers, and those who were neither. By all were they admired, and by all they were said to be peculiarly beautiful. Now, as there is nothing peculiar or uncommon in the subjects themselves, we have every right to attribute to artistic treatment the many charms these photographs undoubtedly possess.

One peculiarity remains to be noticed, viz.: that while the figures are as important as the landscape, they are not more so; and that while the landscape has beauties of its own, they do not detract from, but harmonize with, those belonging to the figures. A few such pictures as these of Messrs. Jackson, Brothers, will soon convince folk that photography has no mean power as a fine art, and that it is mere folly to kick against the steadily advancing tide of its progress.

The photography, apart from the art qualities, is throughout good. There is no under-exposure; no opaque masses of black, no glaring chalky patches of white; but plenty of detail, softness, and vigour; whilst the tone is warm and pleasant and adds much to the sentiment of the pictures by harmonizing with it. We should like to suggest to the artists the value of a little more margin in mounting; but it is possible that the exigencies of the post demanded that those sent to us should be a little curtailed.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Cyanide of Potassium (*continued*).—Having given the best methods of preparing cyanide of potassium, we next pass on to the properties of this salt. The pure salt, obtained by crystallization from an aqueous or alcoholic solution, forms anhydrous octohedral crystals, which, at a dull red heat, decripitate slightly, and fuse to a transparent and colourless liquid; at a higher temperature, approaching a white heat, the salt volatilises unchanged. When quite dry it is inodorous, the smell usually accompanying the commercial article arising from the carbonic acid and moisture of the air decomposing it with liberation of hydrocyanic acid. It has a strongly alkaline and bitter taste, resembling hydrocyanic acid. It is alkaline to test paper, and is very poisonous. The poisonous properties of this salt, as well as the most appropriate means of counteracting its deadly effects, have been recently so fully discussed in our "Scientific Gossip" column, when commenting on the late fatal case of poisoning by its means, that further allusion to this is rendered unnecessary.

Cyanide of potassium dissolves very readily in water. Its aqueous solution may be kept unaltered in close vessels at ordinary temperatures, but when boiled it is decomposed, forming ammoniacal gas and formiate of potash. This decomposition is, however, not complete unless the boiling be continued for a considerable time. If the solution is boiled down with free access of air, a larger quantity of carbonate of potash is formed than of formiate of potash, and hydrocyanic acid is evolved in abundance. When moist lumps of cyanide or its aqueous solution are allowed to remain in contact with the air at ordinary temperatures, it gradually absorbs carbonic acid, evolving hydrocyanic acid, and becoming converted into carbonate of potash. The dry lumps when exposed to the air deliquesce and become wet, when the same decompositions take place.

In absolute alcohol cyanide of potassium is almost insoluble, one part requiring 80 parts of boiling spirit of 95 per cent. to dissolve it. It is somewhat more readily soluble in spirit of 78 per cent.; and is abundantly soluble in spirit of 35 per cent. Strong alcohol precipitates it from its aqueous solution.

The solvent properties of the aqueous solution upon silver salts are well known. It dissolves the chloride, bromide, and iodide of silver, with readiness, converting them into the corresponding potassium compounds, and the double cyanide of potassium and silver. It is of great use in fixing collodion pictures, but is not adapted to positives on paper, as its action is too energetic upon silver, in so finely divided a state as it exists in the dark parts of the paper print. A weak solution of it is very valuable for fixing collodion positives, as it leaves the silver in a brighter and more lustrous form than when hyposulphite of soda is used. Many of our best operators are also in the habit of employing it for fixing negatives, especially when an iron developer is used in preference to pyrogallic acid. A convenient strength for the fixing solution is ten grains of cyanide of potassium to the ounce of water: this may be used over and over again, as it even seems to slightly improve after it has taken up some silver salts. As the commercial salt contains a large, but variable, quantity of carbonate of potash as impurity, and the above strength for the solution has been calculated for the pure salt, it will be advisable to perform a brief assay of its strength previous to making any quantity of fixing solution if required for particular purposes. The details of this assay will be presently given. When fixing with cyanide after an iron developer, care must be taken to wash all the latter solution well off before the cyanide solution is applied, otherwise the reaction between the iron and cyanogen compound produces prussian blue, which will be precipitated all over the surface of the picture. It will be likewise convenient to employ a vertical fixing bath for the cyanide in preference to pouring it from a jug or measuring glass, as owing to less surface being exposed in the former case, the solution will not so readily decompose, nor will the room smell so strongly of hydrocyanic acid. After fixing with cyanide of potassium, the plate requires less washing than if hyposulphite of soda had been used; and if it be required to intensify the picture by a subsequent treatment with pyrogallic acid and nitrate of silver, the surface will be left in a more favourable state for this operation than if hyposulphite had been used.

Cyanide of potassium is a very excellent agent for removing silver stains from the hands or clothes. Moistening a lump of the salt, and rubbing the mark with it, will frequently be sufficient. If, however, a stronger means is required, a solution composed of

Cyanide of potassium	... ...	100 grains
Iodine	... ...	10 „
Water	... ...	1 ounce

may be used with advantage. In any case the part from which the stain has been removed must be subsequently well washed with water.

Cyanide of potassium has remarkable solvent powers upon many metallic bodies, forming potash and a double salt of the metal and cyanide of potassium. It dissolves, in this way, zinc, iron, copper, and nickel, even when not in contact with the air; hydrogen being evolved. Other metals, such as cadmium, silver, and gold, are only dissolved by it when air can have access to it, the presence of oxygen being necessary. It has no solvent action on tin, mercury, or platinum.

In the chemical laboratory cyanide of potassium is of great use, owing to its energetic reducing properties. When heated with a compound, rich in oxygen, such as chlorate or nitrate of potash, it detonates with violence; when fused with many metallic oxides, it reduces them either to the metallic state, or to a lower oxide.

The value of commercial cyanide of potassium, or the quantity of the pure salt which it contains, may be very readily ascertained in the following manner:—It has been found that one equivalent of nitrate of silver, dissolved in water, requires exactly one equivalent of cyanide of potassium to completely precipitate it; and when thus precipitated, it takes exactly another equivalent of cyanide of potassium to redissolve the precipitate at first formed.

A solution must therefore be prepared by dissolving 170 grains (or one equvalent) of pure nitrate of silver in 10,000 grains of water. Each 100 grains of this will therefore contain 1·7 grains of nitrate of silver, aud each 10 grains 0·17 grains. This solution should be prepared with great care, and being properly labelled, preserved for future use in a dark place. When an assay of cyanide of potassium is required, weigh out very carefully 13 grains of the salt under examination, and dissolve them in a small flask in one ounce of water (the exact quantity being immaterial); now measure out 1,000 grains of the standard silver solution, and place it in a tall, narrow 1,000-grain burette properly graduated. Pour from this into the cyanide solution 100 grains of the silver test, and well shake the flask. The precipitate at first formed will probably dissolve readily; then add a little more of the test solution, shake it up, and observe again. Continue adding silver in this way until the precipitate seems to dissolve with some difficulty, when the silver solution must be added with some care, drop by drop, until at last a point is reached at which the addition of a single drop more causes the formation of a permanent precipitate. If the 13 grains of cyanide of potassium were quite pure, this point would be reached exactly at the pouring in of the last of the 1,000 grains of test solution; but we will suppose that an impure cyanide is under examination, and that only 780 grains of silver solution were required to cause the first appearance of a permanent precipitate. The cyanide would, in this case, be evidently impure, and the amount of impurity would be shown by a simple rule of three sum.

as 1,000 grains of test solution.	:	100 per cent. of cyanide of potassium.	: :	780 grains of test solution.	:	78·0 per cent. of cyanide of potassium.

The cyanide under examination contains therefore 78 per cent. of pure cyanide of potassium. The remaining 22 per cent. being impurity.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Invention.—"That property, by virtue of which anything is *originated*." The arrangement and combination of models is that part of invention to which photographers can best lay claim; but the selection and treatment of a view, &c., may also possess a very legitimate claim to be called inventive.

Keeping.—In accordance with the laws of harmony. If the middle and extreme distance should not display such gradations of tone, &c., as may be consistent with the expression of aerial perspective, there is a want of keeping, or in other words, of air and space, or relief. Again, if one part contrasts too violently with its neighbour, there is a want of keeping, and the same will be said of that portion of a picture which does not fall into its proper place as part of the whole, or is isolated and cut off from the rest by undue prominence.

Keeping Down.—The extremes of light and dark, being more prominent than intermediate tones (although, of course, even this must, to some extent, depend upon the ground which they appear on), are said to be kept down when rendered less black or less white. The subordinate parts of a picture, therefore, should not obtrude upon the spectator's sight from either the one or the other cause, but be *kept down.*

Middle Distance.—The central portion of a landscape.

Model.—Every object from which the artist by imitation produces his work, whether living or not, is thus called; but the term more frequently and absolutely implies the men or women whose forms are represented. A good model is a most valuable acquisition to the painter, but is even more valuable to the photographer, inasmuch, as the latter is far more dependent upon his model than the former for his best effects. The photographer will be apt to find the artist's professional model somewhat difficult to manage, because he or she has been educated rather to express the desired feeling by assuming a certain pose, than by working upon the feelings until they find expression in both attitude and face. Models from the stage, on the other hand, are apt to betray too palpably the source of their education, and convey au effect which is termed "stagey."*

* Of course I exclude from this assertion such glorious actors as Fechter reprepresents, whose acting cannot be too carefully studied by the artistic painter or photographer. I shall never forget his Hamlet!

A good imaginative and impulsive model, whose feelings are capable of being wrought up to the desired pitch by the mere reading of the passage you desire to illustrate, the narration of an incident to be represented, or the description of such a feeling or passion as is to be expressed, will be best for the photographer's purpose. It is astonishing how much may be done by these means. A few days since I had a young lady from one of the theatres with me as a model. The expression I desired was that of eager joy. In vain I posed, and posed, and posed again. I got a very nice and pleasant smile, a charming pose, but not what I wanted. At length, in a fit of impatience, I burst forth (earnestly, or I should only have been laughed at) with a description of a brigand's wife, whose dearly loved husband had departed upon an expedition of great danger, checking the rash desires of his brave young spouse, and refusing her permission to accompany him before he went away. You, said I, are this wife, the hour at which you expected your husband's return (here my operator brought up the plate in the dark slide) *so* anxiously looked for, has come and *gone*. Oh! can he be dead, will he never more return! These are the sickening thoughts which dim your anxiously watching eyes as you bend over the rock. Suddenly there is a well-known shout from the rocky heights behind. Your head darts round, joy flashing from your eyes like lightning from a stormy cloud, and there, leaping from crag to crag, alive, and rich with booty, you see your——that's it; keep that expression! one, two, three, and so forth (on goes the cap). Hurrah! bravo! I'm sure we've got it!" And so we had, and the photograph is now on my easel as the groundwork of a painting just commenced. I should never have got the expression I wanted any other way, although it may be thought a somewhat comical method of going to work. That photography, by such, or similar means, can pourtray things generally attributed rather to the imagination of the painter than to that of the model, Rejlander's works can prove. If you have a copy of "The Disciple," a picture of Rejlander's, described by me at page 302, vol. iv, and an engraving from a painting by Etty, bearing the same title,† and will compare them, you cannot fail to acknowledge the superiority of the former over the latter.‡ The photograph is full of feeling and indicates its meaning at once, while the engraving is a mere profile study of a head to which any other title might be as justly applied. I intend to get a copy of both the engraving and the photograph to hang side by side in my study.

The Nude.—An artist's study of the undraped figure may be very materially aided by the photographer. Many of the positions in which models are placed being intended to bring certain muscles into play, and these speedily becoming relaxed, it is only by the aid of memory, and frequently repeated sittings from the model, attended with all the inconvenience and trouble of obtaining precisely the same pose again and again, that each study is at length brought to a satisfactory conclusion. Of course, in draped figures, the difficulty is still as great from the changing of the folds. Photographs of nude models are, therefore, especially valuable to painters, and most of our best men now execute such as aids to artistic study. For the practice of this branch of the profession a soft, even light is required, for which a well-arranged collection of blinds and reflectors of different reflective powers will be essential.

Offskip.—A term not frequently used, indicating that portion of a landscape which recedes from the foreground.

Outline.—The conventional line which is used by draughtsmen to indicate the boundary of vision. A thing unknown to good photographs, although sometimes visible in bad ones.

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† An engraving from this painting was published in the *Art Journal*, but I forget in which volume.

‡ I am told that a print from this negative—looking suspiciously like a spoiled one—is at the Birmingham Exhibition, and that it is so strangely altered by over-printing that many of its chief beauties are lost, and the expression itself suffers lamentably. If this is true, it is very much to be regretted.

ON THE CAUSES OF FAILURE IN THE WET COLLODION PROCESS.

By Professor Martin, of the College of Sainte-Barbe.

In this paper I propose to trace the causes of failure in the wet process, and the means of avoiding them.

The first condition to be fulfilled, is that of well understanding the nature of the collodion, and the elements of which it is composed. I have little to say of the ether, which may be obtained sufficiently pure and rectified at 62°; when newly prepared it is slightly alkaline, and has not been exposed to the action of light in a bottle not quite filled.

The alcohol I employ is that marked 40°, and is easily obtained.

The cotton exhibits the greatest variations, due to the conditions under which it is prepared.

There are four varieties of nitric cotton; viz.—

1st. Cotton of five equivalents of hyponitric acid (fulminating cotton); it dissolves only in methylacetic ether; the resulting solution after the evaporation of the ether, is a pulverulent deposit, which has no photographic application.

In a mixture of ether and alcohol this cotton appears at first to dissolve, but upon being allowed to repose, it all falls to the bottom of the vase in a gelatinous form.

2nd. The cotton of four equivalents of hyponitric acid (soluble cotton), is the true photographic cotton; it dissolves in methylacetic ether, and in a mixture of ether and alcohol; this latter solution, upon evaporation, leaves a transparent film more or less tenacious, according as the quantity of ether is lesser or great in the mixture of the two liquids.

3rd. The cotton of three equivalents of hyponitric acid (powdery cotton), soluble in the same liquids as the preceding, is also soluble in acetic acid, and in diluted nitric acid. The film it leaves upon evaporation is always opaline, and is deficient in tenacity, both from the nature of the cotton, and also because this cotton requires in the mixture of ether and alcohol a greater quantity of alcohol than the cotton of the preceding quality.

4th. The cotton of two equivalents of hyponitric acid is soluble in water, and does not leave a coherent film on the glass; immersed in water, this film disappears completely.

These varieties of cotton are seldom obtained with such decided characteristics as those about to be described; generally, they are mixed in variable proportions in the products met with in commerce.

In 1852 I described a method which permits the obtaining with certainty a cotton entirely soluble in the mixture of alcohol and ether; since that date this method has been followed by one of our principal chemical manufacturers, who assures me that he can always make sure of obtaining the best results.

Since that date, Mr. Hardwich has profoundly studied the nature and manufacture of soluble cotton by the mixture of sulphuric and nitric acids. I have carefully repeated all his experiments; at first I experienced failure due to the monohydrated nitric acid I employed being a little too rich in hyponitric acid; but when I recognised that it was this latter acid which is the real agent of transformation of ordinary cotton into nitric cotton, I completely succeeded. the different varieties of cotton that I wished to study in the manner pointed out by the English chemist.

The presence of the first variety of cotton (fulminating cotton), has no other inconvenience than that of leaving us ignorant of the actual quantity of soluble cotton introduced into the collodion, and of giving it a tendency to blister.

The third variety (powdery cotton) which gives an opaline film, and is deficient in tenacity, may be easily separated from the soluble cotton, by beating the latter a little between the hands, and blowing upon the tufts before introducing them into the mixture of alcohol and ether.

The fourth variety, soluble in water, is only met with in cottons badly washed, but *it is produced in collodion already prepared, when this latter contains alkalies.*

The alkalies have the property of removing from the dissolved cotton a certain quantity of hyponitric acid, and of causing it to pass successively from the first to the fourth variety; to their presence is due the sole alteration collodion can undergo with age in well stoppered bottles, and not exposed to the light.

The last constituent element of collodion is the soluble iodide added to it.

The iodides have a great tendency to combine with a certain quantity of the oxide of the same base, so as to form an oxy-iodide.

The oxy-iodides soluble in water are decomposed by alcohol of 40°, if the oxide is soluble in this liquid; this takes place with cadmium and zinc; potash being soluble in alcohol, the oxy-iodide will be dissolved and the potash will react upon the cotton to cause it to undergo the alterations mentioned above. Thus the collodions iodized with iodide of potassium are always instable, and the photographer desirous of avoiding every source of failure ought to *absolutely proscribe it from the composition of his collodion, as well as every iodide with oxide soluble in alcohol.*

The iodide of ammonium so easily loses its excess of ammonia in becoming yellow, that it may be said to be without inconvenience.

The preceding facts being well known, I make my collodion in the following manner:—

In 150 cubic centimètres (5¼ f. oz.) of alcohol at 40°, dissolve 5 grammes of iodide of cadmium (77 grains) and 6 grains of bromide of cadmium, if bromides are employed. Allow the mixture to subside, when a gelatinous deposit of oxide of cadmium precipitates, then filter and add 350 cubic centimètres (11⅓ f. oz.) rectified ether at 62°. If the ether is not acid, the mixture will remain colourless; by means of a drop or two of alcoholic solution of iodine, I give to it a pale straw colour, then dissolve in it 5 grammes (77 grains) of cotton entirely freed from pulverulent matters. After the lapse of a few minutes, shake the mixture, then leave it to settle.

I do not pretend to give absolute proportions, but a certain mode of preparation. The proportions vary a little in the practice of operators, some prefer a thin collodion, others a thick. The aim of the method prescribed above is to separate the iodide from the oxide it contains, which produces *fogging* and grey tones, and afterwards instability by its reaction on the cotton.

Note.—If the mixture of iodide of cadmium and of a slightly yellow iodide of ammonium be employed, the addition of free iodine becomes unnecessary.

I employ crystallized nitrate of silver for my bath, and if necessary, dry it in a porcelain capsule in a *bain marec.* The fusion of nitrate of silver is always a dangerous operation for the success of photographic processes, in consequence of the possibility of a slight decomposition by the organic matters introduced into the crucible. From 40 to 50 grammes of nitrate of silver are dissolved in 250 grammes of water, into which some drops of a filtered solution (alcoholic) of iodide of cadmium are put, so that there remains a slight excess of non-dissolved iodide of silver; then add the 250 grammes of water necessary to complete the bath; a fresh portion of the dissolved iodide is precipitated; the bath is filtered twice through the same filter, and is then ready for use.

The developing agent must fulfil several conditions:—

1st. It must act upon the nitrate of silver of the film only in those places impressed by light, and not in the substance of the liquid.

2nd. It must penetrate the film so as to act wherever the light has exercised its action.

3rd. It must not begin to act until after one or two seconds, so as to permit the operator to pour the liquid on the plate without leaving stains.

Employed in the following manner pyrogallic acid fulfils these conditions very well.

Dissolve 1 gramme of pyrogallic acid in 15 cubic centimètres of crystallizable acetic acid, and 5 cubic centimètres of alcohol at 40°. This solution will keep a very long time in the dark, and is a good provision for a photographic excursion.

When required for use, add 5 centimètres of this solution to 100 centimètres of water free from lime. Distilled water is not necessary when we first satisfy ourselves by experiment that the solution does not become yellow in the course of a few hours.

Prepared under the preceding conditions this solution serves to completely develop a proof without the appearance of that *black mud* which is due to the reduction of the silver in the body of the liquid and acts to the detriment of the image.

If it be required to strengthen a weak negative, we employ the same liquid, to which a few drops of nitrate of silver, of the strength of 5 per cent. has been added.

Certain conditions of light require operators to develop with sulphate of iron.

In this case I dissolve on the one hand 100 grammes of sulphate of iron in 250 grammes of water; and, on the other, 5 cubic centimètres of acetic ether, and 10 cubic centimètres of alcohol in 250 grammes of water; I add the second solution to the first, and employ the mixture as a developing agent.

For instantaneous negatives I substitute for acetic ether, the nitric ether of commerce, which alcoholized nitrous ether. In this case the solution of iron becomes very brown, and gives a deposit in the course of four-and-twenty hours; but it is only necessary to filter it.

These iron baths, filtered at each operation, may serve many times, and if it be remarked that they give an abundant precipitate in their mixture with the nitrate of silver on the plate, it is because the quantity of light is too feeble for the iron bath; the latter must then be diluted with its bulk of water before being employed.

The fixing is effected with a saturated solution of hyposulphite of soda, in the same manner as the picture is developed.

ON MEASLES; ITS DIAGNOSIS AND TREATMENT.

Think not, gentle reader, I am a learned M.D., about to give you a long lecture upon the complaint of childhood, with which all of you are more or less familiar: no, rather I am about to hold a little conversation with you on a complaint which, to see the many letters addressed continually to the various Journals of our most fascinating art, seems to be the plague and trouble of your every day existence!

I have divided the subject, as you perceive above, into two parts, first, What is really known by the name measles, its character and appearance? and, secondly, What is the best treatment for it?

In answer to the first question; from what I have been able to collect from dealers in albumenized paper, there seems to be two different appearances called by the term measles; one, where, when the paper goes into the gold-toning bath it seems as if its surface was in a flocculent state, minute raised fibres receiving less albumen than the hollow parts, consequently toning first, so that if it be pushed sufficiently far to get the red, slowly toned parts subdued to a purple black, the fibrous parts will have gone into a cold leaden grey, thus giving a flat mottled appearance to the fixed picture. I am now speaking of toning by the common neutral, or slightly alkaline gold bath of chloride of gold and carbonate of soda. The second description, which is generally the result obtained by beginners, or "penny-wise" operators, is a poor, weak, foggy sort of print, without any strength or contrast, it is seen in the pressure-frame before it goes into the gold, and turns rapidly grey in the toning, and when fixed and dry has no sharpness, and seems as if it had been sprinkled all over with sand. This is the result of either starting with too weak a silver bath, or not making sufficient allowance for the amount of silver decomposed in it; some persons are hardly aware of the great amount abstracted by the salt in the paper, besides the mere liquid dried on its surface; from calculations I have made I find, as near as possible, 24 grs. are consumed in each sheet of 22×18, besides one-sixth of an ounce of liquid of the original strength; for the new toning processes the bath ought to be at least 70 grains to the ounce, so that it will be much the best to start with 80 grains; every three sheets will take half an ounce of liquid containing 40 grains, besides 72 grains decomposed by the salt; we have, therefore, only to make a solution of 112 grains to half ounce of water, and add after every three sheets, or one-third of that to every sheet, to keep up the original strength of the bath. This weak effect of picture is also produced by not stirring up the silver after every piece is taken off it; supposing the liquid in the Wedgwood dish to be ¼-in. deep, if two or three pieces are put on and carefully taken off, the silver is decomposed from the surface as well as the liquid abstracted, and from the high gravity of the nitrate, the upper stratum is at length almost water; a piece of glass about three inches wide, and long enough to take hold by, passed backwards and forwards through the liquid without making bubbles will do the job, and it can rest on the edge of the dish until the next sheet comes off.

We shall now proceed to discuss that which is generally known by the name of measles, which we first mentioned above, and to answer our second question. What is the best treatment for it? and here I shall be met with the counter question, Why not find a preventive for it? as prevention, &c., &c. True; but after all the inquiries I have made, it seems impossible to find a certain remedy for preventing it altogether; rolling the sheets before albumenizing, care in the manipulation, drying in hot air, and leaving a short time on the liquid—all go a great way; but still it will occur sometimes, in spite of the utmost care and skill, so that our only recourse is to find out the best method of treating it so as not to be disappointed in wasting our results. It certainly stands to reason, that the best remedy would be to prepare a bath for toning that shall tone to a certain good colour and go no further, but allow the slow-toning parts to catch up tho first tòned, and so make the whole uniform; can such be done? yes, the whole secret is to discard the plain alkaline bath altogether, and to use an organic salt of gold, as introduced by Mr. Hardwich, either acetate or citrate, I prefer tho latter; there is no occasion, however, to use the amount recommended by that gentleman. One grain of citric acid to every grain of chloride of gold, neutralized after mixing with carbonate of soda, will be quite sufficient to produce the effect required; the acid will keep any length of time in solution by putting a small piece of camphor, the size of a pea, into the bottle; it is convenient to keep the acid and soda in solution in separate bottles, both of the strength of one grain in half a drachm of water, or 16 grains to the ounce. It must not be supposed, however, that without care this will always get rid of the measley effect; the paper must be watched while toning, and removed, if very bad, directly the purple tone is reached in the quickest toned parts, never mind the measles looking bad in this stage, it will disappear after fixing and drying; the great fault of those who complain is, they almost always *over-tone* their prints; in endeavouring to get the red mottles toned they go on until the ground colour is completely grey, whereas, had they stopped as soon as the purple was just reached, the print would have been of a rich warm tone, and the measles hardly perceptible; the organic salt of gold has, however, great power in giving depth and richness, hardly ever, without pushing very much, going into the cold stage, so that it is very preferable to the normal solution. There is a great mistake in piling on the gold as some are so fond of doing, most of our first-rate photographers cannot bear it; witness the works of Roger Fenton, Francis Bedford, and Russell Sedgfield, the two last gentlemen asserting that to get an inky black with a heavy deposit of gold, is burying the fine details in the shadows of these pictures in *mud*.

I can fully assert, from having worked very largely for for some time with the last of the above gentlemen, that the whole secret by which their prints are so justly and deservedly admired, is that they follow the invaluable maxim of using "plenty of silver, and of sparing gold."

Francis G. Eliot.

MODIFIED COLLODIO-ALBUMEN PROCESS.

By H. Petschler.*

After a few remarks explaining his reasons for a full and detailed statement of the process, he proceeded—

To begin, prepare tho following solutions:—

NITRATE OF SILVER BATH.

Nitrate of silver crystals	1 ounce,
Distilled water	11 ounces,
Iodide of silver	to saturation,
Acetic acid	a few drops.

To saturate with iodide of silver: dissolve the one ounce of nitrate of silver first in three ounces of distilled water: add to this three or four grains of iodide of potassium. The whitish precipitate formed is iodide of silver. Stir it, and it will presently dissolve, or nearly so. Now add the remaining eight ounces of distilled water, to make up the eleven ounces, as in the above formula. This will cause a re-precipitation of part of the dissolved iodide of silver. Let this milky-looking liquid stand to settle for some hours, and then filter through clean blotting paper, and add the few drops of acetic acid, so that the bath is slightly acid. It is then fit for use. It should be frequently filtered during usage.

PREPARED ALBUMEN.

Tho white of	6 eggs,
Distilled water	3 ounces,
Chlorido of sodium (common clean kitchen salt will do)	18 grains,
Liquor ammonia	60 minims

Dissolve first the salt in water, add the ammonia, and then mix with the albumen. Shake or beat it up into a quick froth. Let this stand a day or so, and filter the liquid formed through a sponge pressed loosely into the neck of a funnel. Keep it in a bottle corked up.

Instead of the three grains chloride of sodium to the ounce, as in the above formula, I sometimes use—

The white of	6 eggs,
Distilled water	3 ounces,
Chloride of sodium	15 grains,
Bromide of potassium	3 grains,
Liquor ammonia	60 minims.

The introduction of the bromide, I believe, makes the pictures softer, but the development is a little longer. With an iodide it takes a still longer time to develop.

To flow the albumen over tho plate without getting air-bubbles, use two beaker glasses or clean cups which will pour well; place a funnel with its spout broken off on one glass, so that it will reach nearly to tho bottom, and press a sponge loosely into the funnel. When pouring the superfluous albumen back from the plate, always pour into the funnel, changing it from glass to glass, as the filtered fluid is being used.

Collodion.—I have succeeded best with a good positive collodion mixed with some old negative; but any good negative or positive collodion itself seems to answer well. An ordinary negative collodion diluted with ether works very well. Of course, whatever collodion is used should be of a known good quality. It does not require any peculiar kind; but if it is not good no process will succeed with it. I have not met with any yet which has not given me tho desired density, with proper development. Always have plenty at hand when working. When many plates are prepared at a time dilute some collodion in a separate bottle with ether, and keep adding it to that in use as it gets too thick, taking care to shake it up before using it again.

PREPARATION OF THE PLATE.

Before commencing to operate have everything requisite

* Abstract of a Paper read at a Meeting of the Manchester Photographic Society, June 5, 1861.

prepared and placed in the places where most convenient to handle. Do this, if possible, an hour or two before beginning, in order that any dust caused by your preparation may first settle. Filter the silver bath, if required. Have plenty of *clean* blotting paper at hand, ready cut and folded, and a clean towel to wipe the hands with; but do not knock this about much whilst using, as the lint is apt to fly from it. Clean and polish your plates well. This should not be done in the operating-room, or at any rate not there immediately before the preparation of the plates. See that no dust is flying about whilo coating the plate.

Warm the plate slightly to a littlo above tho temperature of the room. Get firm hold of it by means of a clean pneumatic plate-holder; but let this holder not bo colder or warmer than the plate, else a ring is formed in the film. Brush it over with a clean, flat camel-hair brush to remove dust, and coat it with collodion. When well set—say in a few seconds, longer or shorter, according to existing temperature—detach the plate from the holder by getting hold of it firmly with your thumb and forefinger by one corner only; and, whenever the plate requires handling during the manipulation, always confine yourself to this one corner: never get hold of it by the sides. Stains are very liable if the plates, especially when wet, are handled too much. When the collodion is well set, dip the plate into the nitrate of silver bath, with one even continued motion. I use a wooden well bath for large plates, well varnished inside and out with shellac. Shake up the collodion in the bottle just used, so that it may be equally mixed again for the next plate: this will, to a great extent, prevent cloudy appearances in the film.

In a minute or so lift the plate in the bath up and down a few times to remove the apparent greasiness from the surface. Leave it in the bath four or five minutes, and give a few more up-and-down movements. Then remove into a dish filled with clean common water, but not into running water.

Coat another plate with collodion, and place into the silver bath as before.

Take the first plate out of the water, always getting hold of it by the same corner as at first; place it on the plate-holder, and pour water over it gently and evenly, until the apparent greasiness on the surface disappears, not longer. This washing should not be too much, as I have good reasons for believing that if too much of the nitrate of silver be removed, it will cause uneven sensitiveness on the film. The amount of water used for this washing is immaterial: it may be used either direct from the tap or from a vessel, but it should be done gently and evenly. I have a flexible india-rubber tube, about half-a-yard long, fixed to my water tap. Holding the plate in one hand and the tube in the other, I play on the surface of the plate gently two or three times all over, when the water will flow evenly down over the glass. Drain whilst in your hand for half a minute or so; in the meantime give the second plate in the silver bath a few up-and-down motions.

Now pour the albumen on the plate, sufficient to cover the surface, without spilling, in one continued wave from end to end, on and off twice. Do not let the wave stop until it gets to the opposite end to the one poured on, else the stoppage will cause a line in the negative. Drain in your hand for a few moments, until the bulk of the albumen is dropped off; then place on one corner, on clean doubled blotting paper, face side to the wall, and wipe the back with some blotting paper. Take care not to let the scratching against the wall cause any dust to fly: in the wet state the film soon catches it up and would cause spots in the negative.

Now take the second plate out of the silver bath and proceed as before, until as many plates as you desire to prepare at the time are finished.

When surface dry or nearly so, say in about an hour, bake the plates, by holding them either before a brisk red fire, or in an oven, or on a hot water bath. I use a tin box with two flat sides, the ends conical shaped, with a narrow base. At the bottom of each flat side is a ledge for the plates to rest on. At the top of one of the corners is a spout. This is nearly filled with water and placed over a Bunsen burner to heat. The water need not be quite boiling, but nearly so—say between two hundred degrees and boiling point. I keep them on this to bake for five or ten minutes.

The only thing necessary now is to wash them well in clean water, and they will be ready for the camera when dry.

After the baking the plates are comparatively insensitive to light, and may be kept in boxes for a very long time, until required for re-sensitizing. A short exposure to a weak diffused light will not do them much harm. However, where it is not inconvenient, I should recommend them always to be kept in the dark; but, in case they be, by chance or by necessity, exposed to light, it is necessary to give a longer exposure in the camera than usual. In this case the negative will acquire its proper intensity before any injurious fogging may appear.

If the plates are wanted to be finished off at once after the baking, they are placed in a dish of common water, running if possible, before they are quite cool, and left in there from five to ten minutes or longer, if convenient; then fixed on the plate-holder and well washed under the tap; and finally (if at hand) flushed over once or twice with distilled water. Let them drain in your hand a few moments, and place on one corner on clean double blotting paper, face side to the wall to dry. After a few minutes change the wet blotting paper for some fresh, else it may cause foreign matter to be drawn up on to the film by capillary attraction. When dry they are ready for exposure in the camera, but do not put them away till they are quite dry. In this state they will keep good and sensitive for months.

When the plates after the baking are kept before being sensitized in water, I should recommend them to be warmed again before the final washing. This will keep the film firmer on the glass.

The exposure in the camera required is about the same as some other dry processes—say about three to thirty minutes for stereoscopic pictures, six inches focus, quarter-inch stop; and about six minutes to one hour for eleven by nine inches pictures, half-inch stop, according to light and subject. This must be learned by experience. When convenient, I should recommend a long exposure, as the pictures in this case are less dangerous to develop.

DEVELOPMENT.

Prepare the following solutions:—

Pyrogallic acid	3 grains,
Citric acid	1 grain,
Distilled water	1 ounce

Filter if not clear.

Nitrate of silver	10 grains,
Distilled water	1 ounce.

Filter if not clear.

Fresh nitrate of silver must be used for this solution, not old silver baths. Also—

Protosulphate of iron	8 grains,
Acetate of soda	4 „
Acetic acid	20 minims,
Distilled water	1 ounce.

This last-named developer was recommended to me by a friend for wet plates. I find it answers well for the dry process.

The development is of great consequence, and in order to get soft and vigorous negatives, it should be begun with very little silver, not increasing that until all the details are well out.

The following mode I find the best:—Hold the plate by means of a plate-holder firmly in the hand, moisten the surface all over quickly and well under the tap or in a dish, and flush it over with distilled water. Take of the strong three-grain pyrogallic developer, as per formula, sufficient to cover the plate well, and pour it on and off several times; then add to the ounce of developer in the cup three to four drops of the ten-grain nitrate of silver solution, and continue pouring it on and off the plate, thus keeping it constantly in motion. After some minutes the picture will appear: first the sky and high lights in the body of the picture, gradually followed up by the less and still less illuminated parts. Continue developing with the same solution until all the details are perfectly out; then take some fresh pyrogallic solution, and dilute it to about half its strength with distilled water, and add about half a drachm of the ten-grain nitrate of silver solution; with this continue developing until the required density is attained. If this should not bring out the intensity, dilute some fresh pyrogallic solution still further, say to about quarter its strength, and add a drachm or two of the ten-grain silver solution: this has never failed in my hands in bringing out the desired intensity. Should the picture give signs of decided fogging before the proper density is acquired, or should it make its appearance with great vigour, quicker than usual—in fact when the plate gives unmistakeable signs of much over-exposure—then dilute the developer at once considerably, and add plenty of silver;

this will soon darken the high lights, whilst the shadows will follow but slowly. Experience only will teach the operator how to humour the negative. Any reasonable exposure too little or too much may thus result in a good picture by slow or rapid development; but I would caution you against a too rapid development, as the resulting picture is likely to be hard. The best way to know when the silver in the developer should be increased is when, looking at the surface by reflected light, the strongest shadows in the negative appear to begin to fog. The pyrogallic should then be weakened and the silver increased, not before.

Another mode of development which I have been very successful with, and which promises to be very useful, especially when pictures have been under-exposed, is, to begin with the protosulphate of iron and acetate of soda developer, as per formula above, commencing with little silver, and increasing it according to exposure. When the details are all out, and the negative gives signs of fogging before the desired density is obtained, then change the developer. Take of the pyrogallic solution, diluted to about one grain to the ounce, and add half a drachm or more of the nitrate of silver solution. This will soon darken it. With this iron and acetate of soda developer very soft pictures may be obtained, and a shorter exposure is necessary. Mixed with the silver it soon gets muddy, and should be changed when it gets too dirty.

By a subdued yellow light, the appearance of a good negative, before fixing in the hyposulphite of soda, should be almost black or dark brown in the high lights, and fogged in the shadows. When the hyposulphite has afterwards dissolved out the iodide of silver, it will appear lighter and more transparent. A good negative should not have any perfectly transparent places like the glass itself. A slight fogging in the shadows, with detail and gradation of tone up to dark brown in the high lights, make rather slow printing negatives; but the best pictures are obtained from them.

When the development is carried far enough wash the plate in common water, and place it in a solution of hyposulphite of soda: say—

Hyposulphite of soda	3 ounces,
Common water	20 ounces,

until the yellowish green iodide of silver in the plate is all dissolved out. Then wash well for a minute or two under the tap, so that no hypo may remain in, and dry either spontaneously or by gentle heat. If the film should wrinkle after the fixing and washing, dry spontaneously: it will then adjust itself.

When dry, examine it by daylight, and see whether all the iodide of silver is out of the film, and whether the negative is dense enough. If all right, then varnish it.

If the iodide be not all out, it may be replaced in the hypo. If it be not dense enough, and the hypo having been previously well washed out, it may then be strengthened by a very weak solution of pyrogallic developer and a ten-grain solution of silver mixed half and half. This must be done very quickly, and with great care, as the negative is sometimes liable to darken very soon, and too much.

Lastly, I will enumerate the most important points necessary for success in the process.

1. Let the glass be of the same temperature or above that of the atmosphere of the room when coating it with collodion. This will, to a great extent, prevent blisters.

2. After taking the plate out of the silver bath do not wash too much, but merely until the water flows evenly over the glass. This will ensure even sensitiveness of the film.

3. Wash well after the baking, so that all the excess of chloride of sodium in the film be dissolved out. The more they are washed the more sensitive they are likely to be.

4. Give plenty of exposure in the camera.

5. Develop slowly, commencing with a strong pyrogallic solution and little silver, gradually weakening the pyrogallic and increasing the silver.

THE SOCIETIES, AND THE EXHIBITION OF 1862.

We have not yet learnt the decisions of the whole of the societies regarding this question; so far, however, they are unanimous in upholding the position of the Parent Society. We extract the following reports from the organ of the societies named.

Birmingham Photographic Society.

A special general meeting of the members of this Society, to which the public were admitted, was held in their rooms at the Oddfellows' Hall, Temple Street, Birmingham, on Tuesday evening, the 25th ult., to consider the position which has been assigned to the art of photography in the Exhibition of 1862, and to arrange for a memorial, and to determine as to the course which, in the opinion of the Society, ought under the circumstances to be pursued. Mr. W. B. Osborne, Vice-President, took the chair, and there was a very fair attendance.

The Secretary read the circular convening the meeting, and the correspondence that had taken place between the Council of the Photographic Society of London, and the Commissioners of the International Exhibition of 1862, as to the position assigned by them to the art of photography in their regulations.

The Chairman, who briefly opened the discussion, contended that a painting and a photograph were equally the result of the genius of the artist, as exhibited through the instrumentality of such tools as might be placed in his way, whether it was by the colours, brushes, and mahl stick in the one case, or by the lens, camera, and chemicals in the other; and, that this being so, they ought to be placed on an equal footing in the International Exhibition.

Several other gentlemen spoke to the same effect; after which

Mr. Brown, Hon.-Sec., proposed—"That this meeting is of opinion that the classification of photography by the Commissioners in their programme of regulations for the proposed International Exhibition of 1862, is both unfair, discourteous, and unjust; and, while they highly approve of the steps taken by the Council of the London Photographic Society, and the arguments used by it in the endeavour to induce the Commissioners to amend the said Classification, would urge upon all photographers the necessity of refraining from exhibiting their productions, or in any way taking part in the Exhibition, until a more fair and equitable position is assigned to photography as an art; and while this meeting cannot but deeply regret the course the Commissioners have taken, they would cordially join the Council of the London Society in presenting a memorial to the Commissioners upon the subject, or in any other course the Council may deem it desirable to adopt."

The resolution was seconded by Mr. C. L. Haines, and was put and carried unanimously.

Mr. Turner then briefly proposed—"That the most cordial thanks of this meeting be conveyed to the Council of the London Society for the praiseworthy position they have assumed in upholding the present important interests of the art of photography."

Mr. Burr seconded the motion, which was carried *nem. con.*

After the usual vote of thanks to the Chairman, the meeting terminated.

City of Glasgow and West of Scotland Photographic Society.

This Society held a special meeting on the evening of the 20th ult., in its usual place of meeting,—Mr. A. Mactear in the chair.

The Secretary intimated that the meeting had been specially called for the purpose of considering a circular and relative documents which he had received from Dr. Diamond, the Secretary of the Photographic Society of London, regarding the position which the Commissioners propose to assign to photography in the International Exhibition of 1862.

Several of the members present expressed their opinions on the question; all, however, fully concurring in condemning the doings of the Commissioners.

Resolutions were then passed, homologating the past acts of the Council of the Photographic Society of London; and the Secretary was instructed to write to the Secretary of that Society, thanking the Council of the Society for what they had done, and assuring them that the City of Glasgow and West of Scotland Photographic Society joined in the strongest remonstrance they could send forth against the *absurd, inconvenient,* and *unjustifiable* arrangement proposed by the Commissioners.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 3rd July, 1861.

It is no novelty to employ glycerine in the preservative processes for wet collodion, but from some cause or other its use has not been persisted in, and it seems to have been consigned to the tomb of the Capulets with the faded glories of honey and raspberry syrup. M. Gaudin, however, has attempted to resuscitate it. Considering that glycerine is unquestionably a substance capable of preserving the humidity of the collodion film, and of preventing the crystallization of the nitrate of silver, and its dissolving action upon the iodide of silver, he concluded that by the addition of a suitable quantity to the nitrate bath the desired result would be obtained.

A large quantity of glycerine may be added to the nitrate bath, as much as ten per cent. in volume, without the manifestation of any other result than a slight cloudiness, due to the precipitation of iodide of silver; but at the end of twenty-four hours a small quantity of black powder is deposited, and after filtration through paper, the bath deposits a fresh quantity. Collodioned plates sensitized in this mixed bath appear to be intact half an hour after being removed from it; but to develop the image it is necessary to immerse the plate again in the bath, before applying the developing solution, without which the sensibility will be found wholly destroyed; thus the presence of glycerine in the nitrate bath produces the expected preservative effect, but to the detriment of its sensitiveness. To appreciate the sensibility of the nitrate bath with glycerine, M. Gaudin, after placing the collodioned plate in a little apparatus with a card pierced with a pin-hole for a diaphragm, he left it while he went out for a walk; on his return he gave the plate two minutes exposure, the time usually required to obtain a visible proof. The collodion appeared intact and moist, but the sulphate of iron developing solution brought out only the sky. In operating again, after the plate had remained half-an-hour in the apparatus, it was exposed the usual time, with the diaphragm; again the collodion appeared intact, and after a fresh immersion in the nitrate bath, the sulphate of iron developed a very pure image as usual, less marked, perhaps, than it would have been with a bath free from glycerine.

Mr. Clarence Morfit has had the ingenious notion of reducing, by means of photography, a large scale accurately divided to the requisite dimensions for micrometric instruments. A scale of ten inches divided into inches and tenths of an inch, was by this means reduced to the length of half an inch, so that the smallest divisions of the micrometer correspond to the two hundreth part of an inch. This method is certainly the simplest and most economical yet employed.

Wooden baths for nitrate of silver solutions appear to present some advantages over gutta-percha or glass and porcelain; the former is so easily damaged by heat, and the latter are very heavy baggage and easily broken. Wood is light, strong, and not easily put out of shape and may easily be applied to the construction of baths of any dimensions. Some light wood, such as poplar or sycamore, which does not split when nails are driven into it, is best adapted for the purpose. It must be well dried, so as to absorb as little of the lac varnish with which it is covered as possible, for, in fact, the wood is only the envelope. It is rendered waterproof, and, consequently, there is nothing to fear from distortion by absorbing the nitrate or the moisture of the atmosphere, nor from the action of the nitrate of silver upon the iron nails. These latter can, therefore, be employed in great abundance, without fear of their being destroyed. If the nitrate solution should happen to reach them, they will be destroyed; but as the action will be slow no injury will result to the bath, the salts of iron are in no respect detrimental.

The thickness of the wood will, of course, vary with the size. Before being nailed together, the pieces should be coated with fresh, plain albumen; and, after being joined together, the wooden bath should be placed in an oven to coagulate the albumen, and afterwards left in a warm place for a day to prepare the wood for the reception of the varnish.

The varnish must be made with shellac dissolved in rectified alcohol, which is the only solvent that yields a uniform, transparent varnish. With ordinary alcohol, the varnish will be opaque, without consistency, and attackable by water. At first a coating of weak varnish is applied, and a second when the first is perfectly dried; and when this is dry, a quantity of varnish should be poured into the bath, so as to cover every part of the interior, then poured out, drained, and dried.

M. Martin suggests the following mode of colouring positive proofs on collodion, copied in the camera from negatives. A plate worked with wet collodion by the ordinary method is developed with diluted sulphate of iron; the developed proof is carefully washed, and before fixing it is covered with a solution of bichloride of mercury. Decomposition immediately ensues, giving rise to protochloride of mercury and chloride of silver; a small quantity of mercury set free fixes itself upon the silver of the picture. When carefully washed, a solution of cyanide of potassium or of hyposulphite of soda previously saturated with silver is poured over the plate; it is left to act for a few seconds, the traces of mercury adherent to the film decomposes the double salt contained in these solutions, and causes a precipitate of metallic silver in a finely divided state, which gives a very fine colouring to the picture. The operation is concluded by fixing in the ordinary manner, preference being given to hyposulphite of soda in a state of concentrated solution, and, after sufficient washing, the picture may be transferred by means of gelatined or albumen paper.

There appears to be a perfect stagnation in scientific discovery; learned bodies are exclusively occupied in the discussion of trite subjects, among which spontaneous generation, colouring matters from coal tar, and the composition of steel. The sudden appearance of a brilliant comet will doubtless relieve the present monotony.

M. Pelouze has made known a curious reaction with chloride of calcium. Acted upon by steam at a sufficiently high temperature, chloride of calcium is decomposed, producing a considerable quantity of hydrochloric acid. The transformation is so quick, that he was first tempted to believe that it offered a new process for the manufacture of hydrochloric acid on a large scale; but further experiments go to show that the production of acid was only abundant at the beginning of the reaction; that to maintain it, required the expenditure of a considerable quantity of steam, and consequently of fuel, so that the manufacture ceases to be economical.

Sulphide of carbon has lately been applied to the purification of oils with much success. It has a great affinity for fatty bodies, as may be shown from the fact that when the bones of which ivory black is made are treated in the usual manner, only five per cent. of fat is obtained; treated with sulphide of carbon, they yield twelve per cent. Immense quantities of soap are wasted in extracting grease from wool; treated with the sulphide, the operation is more efficacious, economical and expeditious. Oily seeds treated with the sulphide yield 10 to 12 per cent. more oil than by the old processes; besides, the oil is purer and entirely free from oleaginous matters, and requires no purification; besides, the oil contains more stearine and margarine, and consequently yields a harder and better soap.

The mode of operating is very simple: the fatty matters and the sulphide are mixed together in a closed vessel, and the sulphide allowed to filter off, carrying with the oil; the receiver is converted into a distilling apparatus; steam is introduced, the sulphide passes off, leaving the pure oil behind. The sulphide can be employed over again.

MODIFIED TAUPENOT PROCESS.

Dear Sir,—The favourable notice you were kind enough to take of the stereograms I sent you a few weeks ago, induces me to offer to the experiments of both yourself and readers what I consider a very important modification of the *Taupenot* process.

As I wrote you in my last, the hot water process, as indicated by Mr. Parry, gives me uniform success; its great advantages are, sensibility, cleanliness in development, and freedom of blistering, wrinkling of the film, &c. It struck me since, that the taupenot or collodio-albumen plates might be treated in the same way, and I am happy to say my supposition proved right, so that we may actually give a collodio-albumen plate its second sensitizing by one continued operation, NO INTERMEDIATE DRYING being necessary. My *modus operandi* is as follows :—

a. Cleaning, collodionizing, sensitizing in ordinary silver bath.

b. Thoroughly washing under a tap.

c. Covering with albumen iodo-bromised. Mr. Whipple's formula is excellent for this purpose, omitting the syrup, after which

d. Immediate immersion in a dish, filled with boiling, or nearly boiling water, taking care to let the water overflow the surface in continual waves. Having taken the plate from this bath, I keep it again for a few moments under the tap to clean the back, lowering the temperature to the mean of the second silverbath.

e. Giving the plate its final sensibility in the second silverbath.

f. Thoroughly washing under the tap.

g. Putting aside to dry in the dark. I use a large deal box, putting the plate on blotting paper, with its face to one of the sides, no harm ensuing, which is not the case in the Fothergill process. When I want to use them the following day I let them rest with the upper edge, for about half-an-hour, against a stone bottle, filled with boiling water, to ensure equal dryness, and as a result, equal development. The plates are really sensible; as a common rule, I give a long exposure—three or four minutes—in the sun, with a Lerebour's landscape stereoscopic lens; but to make a trial I gave a few only one minute exposure at seven o'clock in the morning, and got a good negative, without hardness, and with a transparent sky. So I suppose, that with the new Dallmeyer lens, a few seconds may suffice.

I develop with 3 grains of pyrogallic acid to the ounce, 1½ grains of citric acid; with addition of *very little* silver solution, of 27°. *Great rapidity* may be obtained by using gallic acid, with a little silver, and a few drops of a 5 per cent. acetate of lead solution, only the ensuing negative lacks strength. The collodion I use is very fluid, and contains bromide, in the proportion of two iodide to one bromide.

The second sensitizing bath contains *acetate of lead*. The negatives are remarkably clear, free from any fogging. Washing the plate with dilute gallic acid, after the final washing, following the sensitizing, I consider an improvement.

If the albumen has been used over and over again, stains are sure to make their unwelcome appearance, as I found from experience. So care must be taken to use only fresh solution.

By this somewhat lengthy communication I do not pretend to make a revolution in the collodio-albumen process, only I feel convinced that the working affords greater facility, and that the chief defects, as blistering and danger of unclean development, are done away with. And that these evils are very common, no practical operator will deny; and as a proof, I wish only to point to the many receipts for overcoming the first, and the information that any dirt arising from development may be wiped away by a wet brush of cotton wool.

I hope you will do me the favour of bringing my modification before the public, and giving it a few careful experiments yourself. I first intended to send it as a communication to the Manchester Photographic Society, in compliment to Mr. Sidebotham's valuable advice in your journal's first volume; but as this society holds no summer meetings, I prefer to offer it to the public in good time, through the medium of your esteemed publication.

Within a few days I hope to send you some specimen prints, unfortunately there is actually not one sheet of good albumenised paper in our town. Strange to say, the vilest trash found its way into this market, so that we are anxiously waiting for a fresh supply.—I have the honour to remain, dear sir, yours respectfully, Herman L. T. Haakman.

REGISTRATION OF SOUND.

Sir,—At p. 62, vol. ii., of the Photographic News is a description of a process, then imperfect, by which sound is made to register itself upon a surface prepared to receive it. M. Leon Scott was the happy man to develop, to some extent this happy idea, by himself conceived. It is also stated, at p. 70 of the same vol., that Professor Wheatstone, during a visit to Paris, was invited by the Abbé Moigno to inspect the papers on which these sounds had printed themselves, and is said to have been *greatly surprised and pleased* with what he *saw*. It is also stated that, as yet, no practical advantage has been gained by this discovery; but M. Scott is sanguine that, in course of time, he will so far improve his apparatus that it will be capable of printing a speech, which may be written off verbatim to the great saving of the labour of parliamentary reporters.

Now, sir, I have anxiously waited, and scanned the Photo News, for more than two years, for further information concerning this very interesting and promising discovery; but still no tidings. I feel the more interested in M. Scott's investigation from the fact that, about four years ago, I arose, after an almost sleepless night, with an irresistible conviction, arising out of the conception of the very same idea, that, in a few years our parliamentary reporters would be rendered useless. Some to whom I mentioned the notion laughed, and said, "Oh, you cannot lay hold of *sound*, there is nothing tangible about it—impossible!" Now we don't want to lay hold of it, but if we can devise a surface for it to run over, on which it must leave its visible footprints, we shall be quite contented. Others, not quite so backward at receiving a new idea, thought with me, that as the eye had already been imitated by photography, it was no very great matter to indulge the hope of the ear being represented at some future time by a discovery equally practicable. One gentleman to whom I named the probability of such a thing being matured, said, it was not at all unlikely, for he once heard of a man who was so wise that he could always tell what his neighbour was going to have to his dinner from the smoke of his chimney! Such is the lightness with which some, even intelligent folks, would treat this already partially developed idea; but may I ask you, sir, to impart the stimulus you are able to do, to the emulation of M. Scott by others, in order that this discovery, the results of which have been seen with surprise and delight by so eminent a man as Professor Wheatstone, may be utilized, and take its stand amid the wonders of this advancing age as a great and stubborn reality.—I am, sir, your obedient servant, Phonautography.

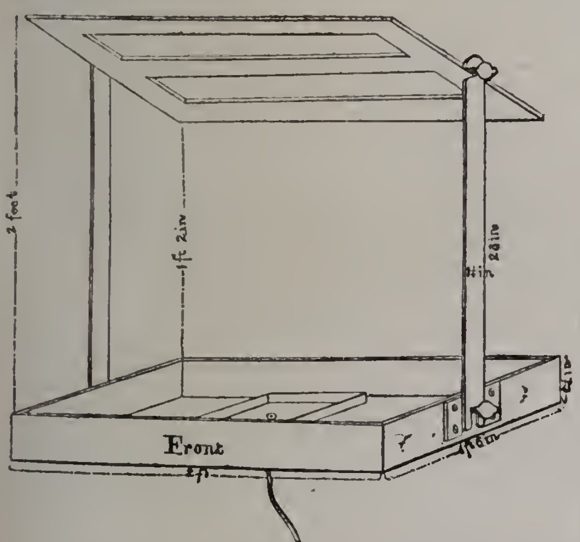
[We have not heard anything more of the subject since the publication of the facts at the period to which our correspondent refers. Possibly some other of our correspondents may have heard if any further progress has been made.—Ed.]

Apparatus.

Sir,—In a recent number of the News you request descriptions of dark tents, which have been found to work satisfactorily; and as I have made one which I have found to be thoroughly substantial and efficient, I send a sketch of the frame-work. The covering is formed of one thickness of black, and one of good yellow calico, sewn into shape, and then tacked on round the edge of the upper frame, and round the upper edge of the shallow tray which forms the table. In cutting out the calico I have done it so as to give the roof of the tent a very considerable inclination towards the back, thus allowing plenty of head room. The front of the top frame is two feet from the tray, the back fourteen inches. At the back there is a space, nine inches wide from the top to the bottom, without black calico, and here the light is admitted through two thicknesses of yellow calico. At the front the covering hangs down in the form of a bag open at the bottom to a little below the waist, round which it draws tight with a piece of whipcord running in small rings. When wanted for use I fix the tray upon the tripod, slacken the thumbscrews in the ends, slip the uprights into their places, where you will observe they are kept from swaying to either side by two small blocks, then tighten the screws against them. Next lift the top frame, slip the screws upon it into the notches at the top of the uprights, tighten the screws, and the tent is perfectly firm and ready for use. For carrying off the water I have a light wooden tray papered inside with porous paper, and then thoroughly coated inside and out with shellac varnish: the paper prevents the shellac chipping off. Four or five feet of india-rubber tubing carry the water to the ground and well out of the way. The cost without the tripod, but with fitting to attach the tripod to, was—

	s.	d.
Joiner	7	6
Calico, 5 yards of black, 7 yards of yellow	5	0
Four brass thumbscrews	1	6
Varnish, dress-maker, rings, tacks, &c. ...	3	8
	17	8

The weight is nine pounds.

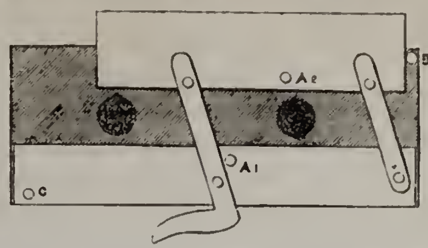


When not in use the tubing is drawn inside, the calico pushed into the tray, the top frame shut down upon it, the uprights laid upon that, and the whole held together with a leather strap with a handle at the side, forming a package $24 \times 18 \times 3$ inches.

As a practically useful tent I believe it will be found better than those sent out by some London makers at more than double the price; some that I have seen could be of no possible use except to sell. William Dodgson.

CAMERA SHUTTER.

Sir,—I have seen descriptions of many ingenious contrivances for opening and shutting lenses, but they seem to me, most of them, so complicated as to be unsuited for the amateur mechanic. In the hope of offering something more simple and adapted for home manufacture, I send you a diagram of one I have modelled for a stereo-camera. It consists, as I think you will understand from the diagram enclosed, of two plates, the under one having the diaphragms in it, the other rising and falling upon it, acting as a shutter, and worked by the lever and parallel bars, the under plate is at the bottom part, of double thickness, so that the shutter when closed lies upon the ledge, and the surface of the two plates is flush for the levers to work upon. A 1, A 2, are two studs over which an elastic band may be passed to ensure closing. B is another stud to which the band may be transferred from A 1, when it is required to keep the shutter raised for long exposure.



A quick exposure may be given by pulling the trigger, till the rise of the shutter is checked by the stud A 1, and releasing it.

If instantaneousness is required, put an elastic band, stronger than that over A A, over stud C, and the trigger, the latter being released by the finger, the shutter will be opened and closed quick enough for moving objects.

Differently sized stops may be furnished if required by circular rotating plates at the back; or, the simple shutter may be made in wood, all except the bars, by the amateur who has not facilities for working in metal.

You will perceive that by the action of this shutter, the foreground has more exposure than the sky, as the lower part is opened first and shut last, and further from the diagonal motion of the shutter the upper portion of the view is uncovered more slowly than the lower, which I consider a great advantage.

G. S. Penny.

Photographic Notes and Queries.

Clean Fingers.

About twelve months since, I noticed a letter from one of your correspondents in which iodo-cyanide of potassium was recommended for taking out stains of nitrate of silver, &c. This it does very quickly and thoroughly when newly made, but in time becomes nearly inert. Lately I have kept a saturated solution of cyanide, and another of iodine, in separate bottles, and when requiring to use the iodo-cyanide have formed it in the stain, by first moistening it with the cyanide then with the iodine. The result is the very rapid removal of silver stains from the hands or linen.

Those who wish to keep the silver entirely off their hands will find it easily effected by taking a pair of buckskin or other gloves made of soft porous leather, putting them on and giving them two or three thorough coats of india-rubber dissolved in coal naphtha, rubbing each coat well in, and allowing it to dry before the next is applied. When well coated they will form a pair of chemical proof gloves.—I remain respectfully,

William Dodgson.

Wigton, Cumberland, June 13, 1861.

Stereo Exchange Club.

Sir,—I have derived much pleasure from being a member of the above; and although some of the pictures I have received were not equal, I consider, to mine, I have been very glad to have them in exchange as the subjects are interesting, either from historical associations, or being localities which I had not visited.

What I now write to trouble you about is the following suggestion:—That in publishing a new list of names none but *amateurs* be admitted (which was one of the *original rules* of the club). I know of one *professional* whose name was in the last list, and there may be more.

With apologies for occupying so much of your valuable space, and many thanks for the trouble you have taken to make the Association work so well,—I remain, sir, your obedient servant,

An Amateur Member.

[We can scarcely see the object of our correspondent's suggestion, as we imagine that where professional photographers join in such an exchange, amateurs will, in many instances, be the gainers. However, we shall be glad to hear further opinions on the subject.—Ed.]

Talk in the Studio.

Scientific Fracas.—The hardest words which occur in photographic meetings do not lead to breaches of the peace; nor is it a common thing, indeed, for such circumstances to occur in any scientific assembly. The *Globe* states that at the close of a meeting of the Ethnological Society, on Tuesday evening, M. de Chaillu, of Gorilla celebrity, having taken offence at some remarks made by Mr. Malone, with whose name our readers are familiar, stepped up to him and held his fist in his face, demanding how he dared to speak of him as he had done, and finished by spitting in his face!

New Materials for Paper.—If the uncertain character of the materials used in the manufacture have hitherto been a source of embarrassment to photographers, it would appear that ere long troubles will be multiplied. A weekly contemporary remarks, that—"When it became evident that the paper duty was doomed, inventions were patented that had been in abeyance in consequence of the duty, and the yet more abominable annoyance to which manufacturers were subject. Within a few months many such patents have been either provisionally registered or sealed. Amongst others may be noticed one by Charles Stevens, of London, for an improved method of preparing sparte, alpha, the dwarf palm, and other gummy resinous plants, to be used in the manufacture of paper, being a communication from Eugene Helenus, of Paris. Michael Henry, of Fleet Street, has also obtained a communication from Paris, and patented an invention to facilitate the decolourising and bleaching vegetable substances, so as to obtain paper pulp. Damaged grain may thus be used to improve the quality of paper. The patent of Thomas Routledge has already passed the great seal for the manufacture of paper from an equal admixture of rags with Spanish grass and other fibrous plants. H. C. Jennings, chemist, London, has taken out a patent to convert tanner's bark and ligneous substances of various kinds into pulp, by means of a solution of lime-water and soda ashes. The organic matter when bleached is reduced to pulp by the machines now used by paper manufacturers. John Smith, of Birmingham, has also patented an invention to reduce sawdust, vegetable fibres, charcoal, and asphaltum into pulp or plastic material, to be moulded into toys and ornaments, and used in the manufacture of parasol handles, knobs for sticks, snuff boxes, pistol stocks, and for articles of greater strength, the composition will be moulded upon metal or wood. Letters patent are also granted to R. H. Collyer, of London, for an improved method of preparing paper pulp from straw, flax-waste, bamboo-cane, &c., capable of being moulded into ornaments, works and house decorations.

To Correspondents.

An Amateur.—You cannot do better than practise the collodio-albumen process as detailed in the article to which you refer. The preparation of the plates takes a little more time than some of the dry processes, but the results are more certain.

A Subscriber from No. 1 to No. 147.—We have heard good accounts of the objectives you name, but have not tried them. Personally, we should be inclined to prefer those of the house you named second. We cannot undertake the responsibility of selecting you a lens. Your developer turning milky when you add silver to it, would indicate that it was made of common water, containing carbonates, or chlorides, or both, instead of distilled water. Possibly it is decomposition to which you refer, and which more rapidly occurs from adding silver from your nitrate bath, instead of from a pure solution kept for the purpose.

J.—In a week or two.

X. P. R.—We have never tried the use of a silver bath rendered acid with nitric acid for the final exciting of collodio-albumen plates; but there are many reasons against the use of an inorganic acid under such circumstances. 2. The bath after sunning and the addition of a minute portion of acid ought to be ready for work. 3. The pungent smell of an old bath generally arises from the presence of acetic ether, which has gradually accumulated. Evaporation is the best method of getting rid of as much as possible; but it is very difficult to get rid of it entirely. Acetate of silver, in the bath, may be decomposed by adding nitric acid; but the acetic acid liberated remains, and is difficult, almost impossible, to eliminate. We shall be glad to receive your remarks on depth of focus in a form for publication.

G. G.—You have got the polish on a little unevenly. The operation necessarily requires a little practice to succeed perfectly. The hinges to which you refer, are made, and are used by camera makers, but by whom made or retailed we cannot tell you. Probably Mr. Meagher would let you have them, as we know he uses them; and also the screws you require. Of course professional camera makers can scarcely be supposed to be very anxious to help amateur mechanics, but we think it is possible you may succeed if you make application.

W. M.—We have not used the lenses to which you refer, nor can we at all undertake to endorse all that is said in descriptive advertisements which appear in our columns. From what we have heard, however, of these lenses, we have no doubt but that they are good for their price.

Caxton.—It is not a common occurrence for the image to disappear on the application of the fixing solution. It arises probably from an excess of organic matter in the image either from the collodion or nitrate bath, most probably the former. To remedy it try another collodion, or use the hypo much weaker. We remember on one occasion being seriously troubled with this tendency of the image to dissolve and then found that by using a slow developer, containing citric acid, the image which came up very slowly showed much less tendency to dissolve, even when all other circumstances remained the same.

C. Williams.—Positives on mica should not be backed with black varnish, as it degrades the tone to such an extent as to spoil them. Where it is available, we prefer a backing of velvet for positives on mica; but for your album we fear that this will be inadmissible. Perhaps the best plan you can adopt is to black varnish another sheet of mica, and place that at the back. By this means the tone will not be lowered as it would be by applying it to the back of the picture.

M. D.—1. We do not quite understand your description; but so far as we do, yes. 2. There is no method of diminishing the size of the image without either retiring further from it, or using a lens of shorter focus.

R. Keene.—We cannot tell where you can get a copy of the photograph you name. Do you not remember the name of the photographer? If you do, that would simplify the matter.

A. B. R.—Such a lens as you describe, made by the best makers, would cost from £5 to £12, depending upon the amount of rapidity you require. Send us your address and we can give you fuller particulars. The addition of nitrate of potash to an iron developer forms a small portion of protonitrate which improves the tone of a glass positive, but we prefer the method given in this column in our last in answer to John Picken. When your iron developer becomes peroxidized, it is better to throw it away. It is very difficult to work with a neutral bath in warm weather, but six or even four minims of acetic acid to each ounce of bath is a great excess. It is easier to work with a weak iron solution, say 10 grains to the ounce, when the weather is hot. A little free iodine in the collodion is a material aid to the production of clear pictures. We shall at all times be glad to hear from you, and any hints suggested in the practice of your own specialities will not be rendered unacceptable by little deficiencies in grammar or orthography, as it is a part of our duty to prepare such communications for publication. A man may be an excellent operator, and at the same time an indifferent grammarian.

Clericus.—Our own experience in the waxed-paper process has not been sufficiently extended to enable us to pronounce with certainty as to the cause of the defects in your negatives. We can, however, make some suggestions. We should, in the first place, decidedly express our conviction that they are under-exposed. The spots and freckles may arise from several causes. We glean from your letter that you do not saturate your silver bath with iodide of silver, this being the case, the iodide of silver, formed on the first contact of the iodized waxed paper with the silver is partially re-dissolved, and would give rise to the mottled effect exhibited. Insufficient time for the iodized paper to become thoroughly permeated by the silver solution, especially in a thick paper like this you are using, will sometimes have a similar effect. The defect may have been in the iodizing of the paper. If the iodide of potassium become at all decomposed, the iodine liberated, acting upon the starch in the paper, gives it a speckled appearance, which, by giving unequal sensitiveness, causes spots in the negative. To avoid the latter cause, the iodized paper should be dried in a dark room, as light aids the decomposition of the iodide of potassium.

Henry H.—The front lens of a half-plate portrait combination will generally cover about 9-in. by 7-in.

J. H. S.—Finger marks on the brass work of lenses may be simply washed off with soap and water, avoiding much soap. If it is much defaced, relacquering will be necessary. We cannot mention any maker's collodion upon which you can always rely as sufficiently textureless for micro-photographs. We have heard of a new portrait collodion, recently issued by Horne and Thornthwaite, which is described to us as giving an exceedingly fine and perfect film; but we have not seen it.

J. C. L.—The acetate of soda in crystals is meant, and the quantity stated is that recommended. You can try with less. We cannot recommend you a negative collodion; all those you name produce good results in some hands. Try a mixture of the last, and either of the others.

F. Brown.—The front lens of your Jamin lens will probably cover about 16 inches, if, as you state, its focus is about 25 inches. As a general rule, you may calculate on a view lens covering a square of about two-thirds of its focal length. The extra lens to be introduced between the front and back lenses, is to shorten the focus and increase the rapidity. Pine, or rather Christiana white deal, which is best for the purpose, will, we believe, answer perfectly well. Black varnish it well inside, and varnish it well with a bright varnish outside. We are afraid that portraits on pocket handkerchiefs would risk rapid destruction by washing powder, &c. Besides, to what a "base use" to put the portraits of one's friends!

Economy.—In order to obtain a more highly albumenized surface, take care to dry by artificial heat immediately after albumenizing. If the paper be hung to dry spontaneously, two causes immediately come into operation, which tend to reduce the amount of glaze on the surface: the albumen gradually soaks *into* the paper, instead of keeping *on* it; and if it be thin and limpid, a portion drains off the surface. Rapid drying prevents this. You will more easily get a high glaze on a stouter paper. The air-bubbles will only be got rid of by skilful manipulation; but the following method will aid you:—use a glass dish for the albumen, and let it rest on four feet at the corners, so that you can introduce a lighted candle underneath the dish, the light thus held will at once show you where any bubbles are, so that they may be removed. Or, you may lift the sheet and examine after it has been on the albumen a minute and then return it. This plan is troublesome. from the curling of the paper.

Z. O. You are a little in error in your calculation; 45 grains are one-fourth of 3 drachms, not 25. Otherwise you are right, and may safely use the formula

C. E. L. Acetate of soda, added to an iron developer, forms acetate of iron. It does not destroy the reducing power of the iron, but it makes the development much slower, and gives more density to the resulting negative It is, however, unstable, and loses reducing power by keeping. It is not necessary to use it, unless you desire its aid in obtaining intensity

THE PHOTOGRAPHIC NEWS.

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PHOTO-LITHOGRAPHY AND PHOTO BLOCK-PRINTING.

In another page we publish a lengthy but interesting extract, from a voluminous specification just published of a patent, recently secured jointly by Mr. Francis Stewart Beatty, photographer and lithographer, and Mr. Thomas Alexander, M.D., of Dublin. The patent includes two distinct processes, one for photo-lithography, and one for producing, by the aid of photography, raised blocks for letter-press printing; but as they are both based on one principle, we presume they will not violate that condition of the patent laws, which makes it imperative that no more than one distinct invention shall be included in one patent. At the first glance, it struck us that nothing new was involved in this patent, as the production of the photographic image on the lithographic stone is by means of a transfer, as nearly as possible similar to that of Col. James; some alterations, and possibly improvements, in detail, being however proposed.

One of the chief and most interesting points, however, in this invention is, the attempt to gain, by a variety of means, the effect of half-tone or gradation of tints. The idea upon which this attempt is based is not new; but some of the means proposed we think are so. The mode of obtaining graduation of tones, which has before been suggested, is that of giving to the stone a grain or texture of some kind. Several modes of effecting this are here proposed. One method is to print upon the photographic transfer previous to placing it on the stone, a mezzotint, aquatint, or other ground by means of an engraved plate having such a ground. Another method is the use on the negative of a coating of resin in alcohol, which is described as having the "property, when drying, of dividing itself into innumerable small cracks, the intervening spaces being opaque or dark;" or, in other words, applying a spirit varnish, which is allowed to chill and granulate. Another method, which appears to have a similar end, is the mixing with the preparation of bichromate of potash, isinglass, &c., various "hard granular substances, such as fine emery-powder, peroxide of iron, glass, and flint finely ground in a mortar." How far these methods will answer the case proposed we cannot yet tell, as we have not seen any of the results; but the object is so desirable that we shall look with considerable interest for specimens. For reproduction of subjects in line or other objects which may be treated in black and white, the processes of Col. James and Mr. Osborne leave little to be desired; but as yet we have seen nothing that has, in any degree, grappled with the difficulties of half-tone; and until this is effected. the use of photo-lithography, except for reproductions, must necessarily be comparatively unimportant and limited.

Another novelty in the patent is the method of giving the image obtained upon the stone, by a direct process instead of transfer, permanent printing qualities. One of the chief disadvantages of the photo-lithographic processes in which the stone itself has been treated with the sensitive coating of organic matter and a chronic salt, has been the fact that the image rapidly chipped off, or wore away in the process of printing. It is proposed to remedy this by covering the stone with "liquid silex, silicate zopissa or aluminate of potash, or other liquid, having a hardening effect upon the stone." The sensitive coating is then removed, so as to bring the greasy ink into immediate contact with the surface of the stone, while the hardened surface resists the action of the printing roller; so that a much more durable printing surface is produced.

A method is also indicated by which an approach to coloured photographs can be obtained similar to the excellent imitations of water-colour drawings already in existence; the combination of the regularly-practised processes of chromo-lithography, and photo-lithography, being rendered possible.

The method of producing raised blocks for printing in conjunction with ordinary types of the common printing, if it can be carried out successfully, we regard as of the utmost importance. Our contributor, Mr. Hannaford, made some time ago some experiments in this direction of a very promising character, the nature of which was briefly indicated in our columns. Whether this method or these here indicated, which appear very simple and efficient in theory, will succeed when brought to a practical test, remains to be proved, and we shall watch with some anxiety for the results.

NEW RESEARCHES ON THE PERSISTENT ACTIVITY OF LIGHT.

BY M. NIEPCE DE SAINT VICTOR.

Upon exposing to a strong sunlight, during two or three hours, a newly broken fragment of a china plate, and then applying it to a piece of paper prepared with chloride of silver, after twenty-four hours' contact we obtain a reduction of the silver salt in the portion corresponding to that which has been exposed to the sun's rays, and none in that which has been protected from them. Certain *tender* porcelains acquire this *activity* more readily than others.

A steel plate, polished in one part, and made rough in another, by means of the action of strong nitric acid, and cleaned perfectly with alcohol, was solarized for three or four hours under the following conditions. Half of the polished and unpolished plate was placed under an opaque screen, the other half under a piece of transparent glass. The plate was then covered with albumenized paper prepared with chloride of silver. After twenty-four hours contact I obtained an impression of the unpolished portion which had been acted upon by light, but nothing from the polished part, nor from the unpolished portion placed under the opaque screen.

A strip of glass, strongly ground or roughened, and perfectly cleansed with distilled water, gave the same results as the steel plate.

I should observe that the light has less action under a violet-coloured glass than under a white glass.

These experiments demonstrate, therefore, that for the reduction of the salt of silver to take place, a chemical action is not necessary, as when we solarize a metallic salt with organic matter, or simply one of the two substances.

M. Arnaudon (chemist of Turin) has repeated some of my experiments in different gases, and the results are the same as those undertaken in the atmosphere. I propose to repeat them in a luminous vacuum.

In a tin tube, lined with card-board, impregnated with tartaric acid, and solarized to the point of very strongly reducing the nitrate of silver, I placed in the middle of the tube, without contact, a small bladder containing a weak solution of starch. After eight-and-forty hours, I ascertained that this starch feebly reduced Barreswil's liquid; other starch placed in the same circumstances, except solarization, produced no effect on Barreswil's liquid.

It is well known that all the resins become oxydized in the light and air, but yet I have not been able to solidify a varnish of bitumen of Judea with the *activity* acquired by a solarized body; a solarized bitumen no longer reduces the salts of silver; that, perhaps, is due to the persistent *activity*, as well as the light, not being able to penetrate and fix itself in the hardened layer of bitumen.

A plate of iron, oxydized in the shade, does not reduce the salts of silver; but it reduces them if it has been solarized.

It has frequently been announced that light magnetizes a bar of steel; but after removing every source of error, I have found it impossible to make a needle, solarized for a very long time under the rays of light concentrated by a strong lens, attract another sewing needle suspended by a hair, whether the light was white or coloured by being made to pass through a violet-coloured glass.

I have also enveloped a needle in paper impregnated with nitrate of uranium or with tartaric acid, and solarized; I have also suspended a needle horizontally in tubes containing solarized card-board, and the results were invariably of a negative character: which proves that the *activity* of which I have spoken above is not due to electricity, as some experimentalists have pretended.

I afterwards repeated the first experiments upon needles very feebly magnetized, to see if I could de-magnetize them; but the results were always negative.

From which I conclude—that this persistent *activity* given by light to all porous bodies, even the most inert, in all my experiments, cannot even be phosphorescence, for it does not continue so long, according to M. Edmond Becquerel's experiments: it is, therefore, most probably a radiation invisible to our eyes, as M. Leon Foucault supposes; a radiation which acts like a gas, since it does not pass through glass.

As to the magnetizing and de-magnetizing, I found it impossible to obtain any results with light alone.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Perspective.—The laws of perspective are so far useful to the photographer, as they test the accuracy of his production, and point out how he may represent his subject in order to obtain the best and most truthful effect. Aërial perspective has already been treated under various heads in these papers, so that we have now only to describe briefly linear perspective.

There are two kinds of linear perspective, of which it will be necessary to treat in this place, namely, "plane" and "panoramic."

In plane perspective the series of "visual rays" or lines, supposed to be drawn from the various points of the objects to be delineated to the eye of the spectator, are cut by a vertical plane, called the "plane of delineation," or the "plane of the picture." Thus, if in looking through a window we draw on the glass, previously prepared for such purpose, with strong gum-water, an outline of the objects seen, taking care not to change the position of the eye, such outline will be in correct plane perspective, and the glass will be the plane of delineation.

Some of the more important terms employed in linear perspective, will require to be shortly defined. These are:—

1. The point of view, or point of station.
2. The point of sight.
3. The horizontal line.
4. The vanishing points.

The *point of view* is, as the term itself implies, the position occupied by the eye of the spectator.

The *point of sight* is that spot directly opposite the spectator, to which his eye is supposed to be directed when he looks straight before him.

The *horizontal line* is drawn through the point of sight parallel to the horizon. It resembles the boundary line where the sea and sky seem to meet. All horizontal receding lines must incline towards it; those above the eye, downwards, and those below, upwards. Bearing this in mind, it will readily be seen—as I have before shown—that some judgment is necessary in deciding its height in the picture. As a general rule it may be stated that in a view taken at a low elevation, the horizontal line should be drawn, at from one-fourth to one-third the height of the picture; at ordinary elevations, about one-third, or, perhaps, a trifle higher, and, from a high point of view, up to one-half above which, excepting in "bird's-eye view," it ought never to be placed. From not knowing this rule photographers frequently mount their prints in a way that is quite an eye-sore to the artist; charmed with the definition and detail of the foreground, they fancy that because it is good they cannot give too much of it.

The *vanishing points* all lie in the horizontal line, and to them horizontal straight lines, not absolutely parallel to the plane of the picture, converge. The point of sight is the vanishing point for lines at right angles to the plane of delineation; whilst the vanishing points for lines at other angles is, where a line drawn from the point of view parallel to them, meets the plane of the picture. At these points, if indefinitely extended, the lines would appear to meet. Looking through a tunnel twenty-two feet square and a mile long, holding a piece of glass one foot from the eye, the opening at the further end of such tunnel will occupy a space on the glass, otherwise the plane of delineation, of only the four-hundredth part of a square inch, whilst at ten miles distant, or even less, the sides of the tunnel might practically be said to meet.

In *panoramic perspective* on a *plane* surface, the position of the plane is changed with each motion of the eye, and we thus obtain a panoramic view on a *plane* surface according to panoramic perspective, that is, with horizontals and perpendiculars vanishing in curves.

In "composition" photography, when figures are taken separately to be afterwards represented upon different planes of the picture, the proportionate diminishment of the said figures should also be carefully considered in reference to the laws of aëreal and linear perspective.

The following method will in this case serve your purpose. An object, say, six feet in height, and four yards from the perspective plane, is represented by two inches height in the picture. Now, supposing you desired to depict some other object sixty feet in height, and forty yards distant from the perspective plane, such object must in the picture be exactly the same height as the first; because by multiplying the dimensions given to the object in your picture by its distance, and by some actual object you wish to represent as above described, and then dividing the product of the photographed or drawn object by that of the real one with the distance, the *quotient* will give the size required.

Easy and important as it is to determine the relative sizes of objects as they retire from the eye, errors in this are by no means uncommon in the works of our "composition" photographers. For those, however, who are too idle for even this small amount of calculation, and who would rather produce their picture, and test it afterwards, a method will be found in calculating the height of the horizon as so many feet, four, five, or six, or more, as the case may be, and drawing a line from some object in the foreground of a certain height to give the relative height of other objects as they retreat, but this is a comparatively clumsy, uncertain method, and can scarcely be put in practice until after your picture is taken and printed.

Picturesque.—Natural scenes and objects possessing in themselves the elements of a picture would be thus described.

Reflected Lights.—Lights reflected from surrounding surfaces upon the shadowed sides of objects in their vicinity. Photography, owing to the inequality of chemical action in the shadowed and lighted portions of any image thrown upon the sensitized surface, derives no small aid from the presence of these reflected lights; tending as they do to reduce the more violent character of the contrasts of light and dark, and consequently equalize their photogenic powers. Actual shadows are never the opaque patches of dark still too commonly seen in photographs. In nature, delicate reflected lights steal into the depths of every shaded passage, but are so tender and soft that it is only in the hands of the most skilful and artistic of our best operators that they are secured in exposure, preserved in development, and not lost in the printing. To render the action of such lights more powerful, and so lessen the chance of losing them, many photographers use (in their glass rooms) screens for reflecting light, having either a white surface, or one of tin-foil; and so contrive to secure the proper amount of detail, and the true depth, transparency, and gradation of the shadows. When the brows of a model so project that the eyes are shrouded in the depths of their cavernous sockets, and would be hardly visible in the photograph, a swing looking-glass placed on the floor may be used to reflect a strong light upwards.

Repose.—That quietude of treatment and subject which gives little contrast without monotony, and a subtle gradation of tones without extending over a very large compass, constitute this quality of a picture as far as monochrome works are concerned.

Second Distance, or middle distance, both terms being in frequent use.

Scientific Gossip.

THE subject of the spectrum, and of spectrum analysis, is one which has, on several occasions, been brought before our readers in our scientific columns. We propose again reverting to the subject this week, in connection with a new instrument which has just been brought out by Spencer, Browning, and Co., of the Minories, from designs furnished by Mr. Crookes. It is called the spectroscope, and, for portability and efficiency, is certainly as perfect an instrument, of the kind, we have ever seen. When closed, it packs in a morocco case not more than $4\frac{3}{4}$ by $2\frac{3}{4}$ inches square, and $1\frac{1}{2}$ inches thick. When arranged ready for use, it forms a graceful-looking instrument in polished brass, consisting of two thin tubes about 4 inches long, diverging at an angle, in opposite directions, from a central chamber which contains the prisms. The front tube is furnished at the end furthest from the prisms, with an adjustable slit, and has at the other end a collimating lens which renders the rays of light, coming from the slit, parallel, before they pass through the prisms. The slit itself is furnished with a double movement; one, by means of a screw, altering its width, from $\frac{1}{10}$th of an inch to the $\frac{1}{1000}$th, or even less, until the knife edges close altogether; the other raising or lowering the entire slit, without affecting its width; so that with the highest magnifying powers the whole of the solar spectrum may be successively brought into the field of view. This seems to be a great improvement upon the old methods of effecting the same object by moving the telescope in azimuth as in Steinheil's instrument, or rotating the prism as in Bunsen and Kirchhoff's arrangement; the former making the instrument more complicated, whilst the movement of the prism the least fraction of a degree from its proper position of minimum deviation, throws the instrument out of adjustment. The other tube, on the opposite side of the prism chamber, forms a telescope which is fitted with eye-pieces of different powers. For ordinary work we prefer the lowest power, but for very refined investigations the highest powers are required.

The method of using this instrument is very simple. The two tubes merely require screwing into their places in the prism box, the slit adjusted to the proper width, and the telescope brought to the proper focus, when the observer may at once see the spectrum of any source of light to which the tube, carrying the slit, is pointed. Thus it is only necessary to place in front of the slit a spirit or gas lamp burning with a colourless flame, and then introduce into the outer envelope of the flame a fine platinum wire having on its extremity a portion of some soda compound, when the brilliant yellow line characteristic of this element, at once flashes across the field of view and remains there so long as the smallest particle of soda continues to be present on the wire.

In a similar way, we have been told by Mr. Crookes, that he has been able to perform with the greatest ease, and in a very few minutes, analyses of different iodizing compounds in general demand, finding sodium in one, potassium in another, cadmium in a third, a mixture of two or more iodides in a fourth, calcium, strontium, or barium in others, and so on. And all this with an accuracy which, by the old method of analysis, he could not approach without devoting some hours to the study.

We have likewise found this instrument of considerable value in testing water. A single drop of ordinary spring water, if evaporated on the end of the platinum wire and then introduced into the flame, will generally show the beautiful spectra due to potassium, calcium, and sodium, and thus affords a ready test of its value for photographic purposes. If one drop yields an appreciable quantity of lime to the spectrum test, the water should not be employed, as it is probably so hard that crystals of carbonate or sulphate of lime would be precipitated in the pores of the picture during washing. We also find it advantageous to test distilled water in this way. One sample recently sent to us having been found to produce spots and stains on our pictures, was tested in this instrument, when it was seen to contain a considerable quantity of soda and lime. The vendor had evidently sent out common in mistake for pure distilled water.

If the spectroscope is pointed to a yellow soda flame, and the slit reduced to very narrow limits, the soda line will appear *distinctly double*, if the high-power eye-piece be applied to the telescope. This is certainly a wonderful feat for so small an instrument to perform. Some years ago an instrument several yards long was required to see this line double; lately, the arrangements have been so far improved as to reduce this length to two or three feet; but it will surprise our scientific readers to hear that this optical feat can now be performed by an instrument only 9 inches long, capable of packing up into the size of a pocket-book, and weighing only 8 ounces.

When the spectroscope is pointed to the sun or a white cloud, the fixed lines in the solar spectrum are brilliantly distinct; and if the sun be allowed to shine through the slit, they can be seen from A in the extreme red, to beyond *l* in the lavender; D (the reversed soda line) being distinctly double.

If, whilst the spectroscope is pointed towards the sky, a piece of coloured glass is placed across the slit, the absorptive power of the glass is readily seen; and if it be yellow or orange glass which is under examination, the value of it for photographic purposes is apparent at a glance. A good piece of glass, one which will not allow photographically-acting light to pass through, will be seen to be absolutely opaque to the rays of light in the lavender, violet, indigo, blue, and half-way in to the green space: an inferior quality of glass will be found to be transparent to the whole of the green rays and some of the blue, and would thus admit of the passage of light capable of acting on bromide of silver, whilst it would not affect the corresponding iodide. The results which we have met with, whilst testing in this way differently coloured glasses for our own use, have proved so unexpected, as well as of such great value to ourselves and friends, that we are anxious to enable the readers of the PHOTOGRAPHIC NEWS to participate in these advantages. With this object, therefore, we have great pleasure in announcing that if any photographer will forward to our office one or more small pieces of coloured glass or other medium which he proposes to employ for illuminating the dark room, we will submit the same to examination in the spectroscope, and report upon the value of the different samples of glass, in a succeeding number of the PHOTOGRAPHIC NEWS. Amateurs as well as professional photographers will thus be placed in possession of all necessary information to enable them to have their rooms perfectly free from injurious light. The pieces of glass need not be more than an inch square, and should have a piece of paper gummed on one corner on which is written the name of the sender and any particulars which can be procured respecting the quality or composition of the glass, together with, if possible, the maker's name.

DEVELOPMENT AND STRENGTHENING NEGATIVES BY SULPHATE OF IRON.

BY M. A. GAUDIN.

Sulphate of iron has of late been largely substituted for pyrogallic acid in developing collodion pictures, on account of the great facilities it offers for strengthening the image. The pyrogallic solution is more certain, on account of the more definite condition of all the products employed. The silver bath is made with fused nitrate, which is neutral. Pyrogallic acid and glacial acetic acid are also very definite products, and in employing the latter in constant proportions, few variations are remarked; but the developing solution must be renewed every day.

With sulphate of iron the results are very variable, and we are frequently obliged to stop the developing without knowing why, if we wish, be it understood, to obtain the maximum sensibility, and obtain negatives fit for printing with at once.

The silver bath should generally be acid. It is frequently prepared with crystallized nitrate, but the proportion of acid the salt contains varies too much. It is better to prepare the bath with fused nitrate, and acidify it afterwards with a few drops of dilute nitric acid.

The sulphate of iron is of itself naturally more or less a reducing agent; but it is greatly too much so to act without the addition of an acid and an oxidation by contact with the atmosphere.

The formula which appears to me the best is composed of 50 grammes of sulphate of iron and 50 grammes of glacial acetic acid to one litre of water (or 5 per cent). The solution must have acquired an amber hue before it is used, which may be effected by shaking a bottle half filled with the solution, from time to time, and removing the cork for the admission of air. When the liquid becomes red, it is fit for use. It is poured upon the plate like pyrogallic acid in order to retain the nitrate of silver which is essential to the development of the image.

When the plate has had a lengthy exposure, it often happens that the picture is *fogged*, which does not appear to be due only to the concentration of the bath upon the plate; for in that case we should not prevent the veil by returning the plate to the bath before proceeding to develop it.

The salt of iron proper for development is always composed of a proto salt and a salt of the peroxide. The protosulphate of iron which, digested for some time with a tenth of its weight of nitric acid, and as much sulphuric acid, is red when diluted with water, and far from causing the picture to *appear* it *dissolves* it rapidly. By increasing the proportion of natural sulphate of iron, it becomes capable of making an image appear; but by prolonging its action, it makes it *disappear*, and it is only by increasing the proportion of protosalt that we arrive at a mixture which acts well, and exhibits a colour like that of beer, when diluted with water for use.

This sulphate will keep an indefinite length of time without deterioration. I have recently made use of some that has been kept in a well-corked bottle for twelve years, and found it to act very well.

The red sulphate of iron so rapidly dissolves the metallic silver which forms the collodion picture, that it may even be employed to remove the silver; by allowing plates to remain some time in a bath of this sulphate, they come out quite transparent, and collodion only will be found remaining on their surface.

Pictures developed with sulphate of iron are composed exclusively of metallic silver. This is why negatives are visibly strengthened when we pour over the glass plate—after washing with hyposulphite followed by a perfect rinsing—a solution of corrosive sublimate of the strength of 1 to 2 per cent., or a solution of chloride of gold of ½ or ¼ of one per cent.; after slightly acidulating them with hydrochloric acid. With the mercury they become blueish white, and with the gold solution they assume a golden hue.

M. Rivot passes the plate into a concentrated solution of sulphuretted hydrogen, after the application of the mercurial salt followed by rinsing, and, by repeating these operations a certain number of times, he often succeeds in converting a weak positive into an intense negative, in which the original image is perfectly preserved.

I was curious to learn if a negative, treated with the alcoholic tincture of iodine would become stronger by this change. I found the image well preserved by this treatment; the alcohol and iodine evaporating left a very pure yellow image, but too weak to print from.

The strengthening which to me appeared the best is that produced by chloride of gold; it yields very pure printed positives.

Without having recourse to gold, mercury, or sulphuretted hydrogen, it seemed to me advantageous to first strengthen the image by the sulphate of iron itself by placing the plate again in the silver bath after being well rinsed subsequently to the first development, and then pouring again some sulphate of iron over its surface; but there must be no tendency in the latter to fogging, and it must be kept carefully out of the influence of actinic light.

In conclusion, to employ sulphate of iron for the development of pictures; we must always have at command some *red* sulphate to add to the sulphate in use when the latter *fogs* the pictures; by this means we in no particular change the silver bath nor the supply of sulphate of iron, and we shall certainly prevent the appearance of the general fogging which is so easily produced.—*La Lumière.*

ON PHOTOGRAPHIC PRINTING.

BY COLEMAN SELLERS.*

The next best thing to originating improvements in an art is the careful selection from the discoveries of others, and the reduction to method of the gathered knowledge. Knowing nothing of the art of printing and toning but what I have learned from others (except in some of the detail), it may look like presumption for me to write on the subject; nor should I do so, did I not hope that my testimony might induce others to abandon the old toning and fixing bath for the more rational one of toning and fixing separately I am well aware that the majority of operators have adopted the improved processes for albumen prints, while they still adhere to the old bath for ammonio-nitrate prints, some because they fear to change, and others, having tried the new processes and failed or only partially succeeded, have not had patience enough to experiment; there are also some, I am sorry to say, who eschew all books, and who are quite guiltless of all extravagance in the book-buying line.

When the idea first occurred to me of introducing photography as an aid to the draughtsman in the machine shop, I did not think it would have grown to the extent it has, nor have been of such inestimable value. As the various machines were finished, and had been in succession transferred to glass with all the truthfulness of sun pictures, then with the increase of negatives came the necessity of producing enormous numbers of prints to meet the demand of our customers for pictures of our tools. This led to the employment of a boy, whose sole business was to print from as many negatives as he could manage at one time. With convenient arrangements for toning and washing, our con-

* Condensed from *Humphrey's Journal.*

sumption of paper has been sometimes as high as one ream a month. Some of these prints made two years ago seem as bright as when newly made; but others have begun to fade and had shown slight symptoms of fading before I changed our process. Since being convinced of the necessity of this change, I have tried every process that has been offered, and have got good results from a great many of them with albumen prints, of which we produce thousands; but with the ammonio-nitrate prints, I must say that for a long time I was discouraged, and many times was tempted to go back to the old bath, shut my eyes to the evils, and go it blind; but now I rejoice in having triumphed over the difficulties, and I see no trouble in the future.

In detailing my experience and publishing my processes I offer nothing new, but only show how I have profited by the teaching of others; and if these pages should meet the eyes of those who have originated the processes, and they shall recognise their own property, let them at the same time receive my hearty thanks.

It is a well-known fact, that to produce a good albumen print requires a more intense negative than an ammonio-nitrate print; and all writers agree in asserting that a good print cannot be produced from a feeble negative. In fact the contrast in the negative must be such as to enable the shadows to be quite bronzed without injuring the high lights; this bronzing cannot occur without considerable exposure. With ammonio-nitrate prints, toned in the old way, a feeble, or comparatively feeble, negative produces a good picture; but in all my experiments I have found that prints made from such negatives, toned in an alkaline solution of gold and afterwards fixed, are feeble and slaty, while prints from negatives designed for albumen paper have been quite readily toned. However, I have concluded that the process must begin with making the negative slightly more intense than is absolutely necessary for the old style of toning, and printing the picture deeper in the shadows. If, however, the negative is no more intense than is usual for plain prints, they had better be printed in diffused light, which, from the slowness of the operation, is not very profitable where many prints are required in a short time; hence, too much care cannot be taken in producing the negative of precisely the right degree of intensity.

In salting the paper there need be no change from what is usual. My plan is to use chloride of sodium in preference to chloride of ammonium, and to make the salting solution at the rate of 45 grains of salt to the quart of water. It is not well to salt more than enough for a week's work at one time, and keep it when salted in a dry place. Do not let the paper lay long in the salting solution, but merely pass it back and forth once as quickly as possible, then hang up to dry.

In preparing the ammonio-nitrate solution I prefer the plan recommended by Hardwich, which is this:—Dissolve 1½ oz. of nitrate of silver in 8 oz. of water; reserve from this 1 oz. of the solution; to the balance add, little by little, aqua ammonia until it has cleared; then pour in the reserved oz.; this should make the solution turbid again; shake well, and if it seems very turbid, add one drop of aqua ammonia, and shake well again: repeat this one drop at a time until it has begun to clear, but still so that it has quite a milky look. Next make up the whole bulk to 16 oz. with water.

In applying the solution to the paper I prefer to use a brush made by pinching some folds of Canton flannel between two plates of glass, allowing an edge of the folds to project about two and a-half inches wide, securing the whole by twine tied round the plates. The solution must be filtered before using, and what is poured from the paper should go into the stock solution, and not into the filtered lot from which the papers are being silvered. The plan we have adopted for silvering is, to place as many sheets as are designed to be silvered in a pile on a clean board used for the purpose, and tacking down the whole pile by the corners, then pouring the solution on to the top one, and spreading it over with the brush; the sheet can be torn loose from the tacks by inserting the finger under it, and then gathering up the corners so as to retain the extra liquid, it can then be poured into the funnel of the stock bottle. This tacking down the whole lot of paper at once saves much time.

The printing, as I have already remarked, should be deeper than what is usual for plain prints, that is, deeper in the shadows. According to my experience, the half-tones must be rather darker than what is wanted; but still the high lights must be left clear.

The print I enclose is one toned by the process I am about to describe, and by a boy who had had but one lesson. His prints have been uniformly as good since this was made, hence I infer that the process is reliable, and readily acquired. In relation to the toning solution I prepare three separate solutions. The first of which I label "gold solution," is the usual standard solution—32 oz. of water, 32 grains of chloride of gold; the second labelled "soda solution," is—32 oz. of water, 2 oz. of bicarbonate of soda; the third labelled "fixing solution for ammonio-nitrate solution" is —32 oz. of water, 6 oz. of hyposulphite of soda.

The prints collected at the end of the day's printing are washed in running water for about thirty minutes, being kept away from the light. While they are washing I prepare in a large flat dish the following solution:—water 32 oz., gold solution, 1 oz., if there are as many as six full sheets to be toned, *i.e.*, in the proportion of one-sixth of an ounce to each sheet of Saxe paper. Now fill a minim glass with the soda solution, and add this, a little at a time, to the gold solution in the dish until it has become neutral to test paper. Note the quantity of soda required to neutralize the 1 oz. of gold solution, and make a memorandum of it on the label of the gold solution bottle. This saves trouble; for, at another time, it is only necessary to add this quantity to each ounce of gold in the solution without repeating the test. But care should be taken to establish this quantity upon the mixture of every fresh sample of gold.

Into this neutral gold solution now lay the washed prints one at a time, until they are all, in face down. Begin at the bottom, drawing them out and turning the face up. Note if they have changed colour but are still of a reddish hue; do not let them become quite black; throw them into the water as they come to tone.

When they are all toned, pour your fixing solution into a dish and put in the prints. Now comes the important part. If the prints are over-toned, they will not redden in the hypo.; if they are under-toned, they will be very red; but if they are only slightly red, they will be right, drying of a dark rich colour, not blue and slaty. Five minutes is long enough for them to remain in the toning solution, and they must only remain in the fixing solution long enough to fix them. Wash well after fixing.

The above are the exact directions given by me to those I have taught, and who have in every case followed the plan with uniform good results. Desiring most earnestly that what I have written may be of use to some of my readers, and hoping that the knowing ones will pardon my dwelling on what I have no doubt is familiar to them, I leave the subject for the present—proposing, if our kind editor wishes, in another article to give an account of how to tone albumen prints alone, and ammonio-nitrate and albumen prints together, when both kinds are printed on the same day.

Let me, however, in conclusion, insist that, if any of my readers conclude to try the process I have described, they mix all the solutions fresh, and, on no account, use old ones.

(*To be continued.*)

HELIOGRAPHIC PRINTING.

This is the title given by Messrs. F. S. Beatty and S. Alexander of Dublin, to a process—or rather two processes—they have just patented. One is for photo-lithography, and the other for photo-block-printing. The details are given in the specification as follows :—

The object of this invention is improvements in the production of photographic proofs and their application to printing purposes. We have given to the processes, described in this specification the name of heliographic printing, and it is performed in the following manner :—We take a sheet of paper or any other substance free of granular texture, and we coat its surface evenly with tho transfer medium ordinarily used for transferring drawings, plaus, or delineations to stone or zinc, or we take any other suitablo transfer matter or composition used by lithographic artists, which answers the purpose; but we prefer the medium composed of two ounces of isinglass, quarter of an ounce of arrowroot, quarter of an ounce of gum tragacanth, and four ounces of flake, white, or washed chalk. The isinglass, arrowroot, and gum tragacanth are dissolved separately by boiling with water aud afterwards mixed together; the flake white or chalk is then added thereto, and coloured slightly with gamboge. This composition, when warm, is about the consistence of cream. We apply it in that state with a flat brush or sponge to the surface to be coated; the surface thus prepared, when dry, is hot-pressed or callendered.

Although wo have described paper as the surface on which lithographic artists spread their transfer medium and compositions, other substances free from granular texture are and may be employed. such as metal foils, vegetable parchment, and paper impregnated with india-rubber; these we beneficially employ in this invention to coat with the sensitive medium hereinafter described, or upon which to spread the transfer composition, and also for the transfer composition.

In addition to that we have already described we use gelatine, size, dextrine in solution, arrowroot, wheat, barley, and rice flours made into jelly paste, to which may be added flake white and gamboge, lucine or vegetable albumen, and also animal albumen, either alone or covered with the transfer medium. We sometimes impregnate the paper with a composition of asphaltum dissolved in turpentine, or benzolo and caoutchouc dissolved in chloroform.

If the photographic proof to be reproduced bo formed of delicate shading, we mix with the composition already described hard granular substances, such as fine emery powder, peroxide of iron, glass, and flint finely ground in a mortar in proportions according to the judgment of the operator.

In order to make the surface prepared as described capable of producing a photographic proof, we employ any chemical agent that possesses the property of being rendered insoluble in water by exposure to light and an absorbent of greasy matters when dry; we use, for example, bichromate of potash or other chromate salt having similiar properties. When in combination with isinglass, gelatine, dextrine, albumen, or gum arabic, and, although a saturated solution will answer, we prefer a concentrated solution of the bichromate of potash in warm distilled water, to which is added a solution of isinglass, gelatine, dextrine, or albumen (gum arabic giving inferior results), either separately or in combination with each other, the strength of the latter solutions being determined by the nature of the objects to bo produced. When cold, the combined solution will be of a deep orange colour, and is heated before using it. Further operations with it are conducted in a room from which daylight is partially excluded. A quantity of the solution as described is poured into an earthenware tray of the size to answer the prepared surface, and it is carefully taken by the corners and its middle allowed to come in contact with tho liquid, dropping the corners gradually to prevent air bubbles; if any be formed, they should be removed with a glass rod. Having allowed it to remain some minutes upon the solution, changing its position at intervals, it is lifted and allowed to drain, and primed up by one of the corners. When thoroughly dry it may be pressed or callendered if necessary; this operation of sensitizing the prepared surface may bo perfotmed a second time. By the well-known processes of photography, photographic proofs are obtained which may bo negatives or reversed negatives of tho objects which wo wish to make a printing surface on stono or zinc, and may bo photographic representations of natural scenery, portraits, drawings, engravings, written documents, manuscript plans, and printed matter. For convenience, we prefer the employment of glass negatives and reversed negatives in connection with a photographic copying frame. The negative or reversed negative being laid therein, the prepared surface is laid thereon, aud tho frame screwed down; it is then placed in the sunshine for a period of time, ten minutes or so. Diffused daylight will answer, of course allowing a much longer period according to the judgment of the operator. When sufficiently lighted, the copying frame should be removed into the dark room. Upon inspection it will be found that a faint image is formed on the prepared surface.

Tho next operation is to utilize this property of the chemical action of the light, and to change the nature of the imago in order to produce a printing surface. This wo perform by an impression taken from a metal plate executed by an engraver; it may have on its surface a mezzotint or aquatint ground, or it may be a ruled plate, the lines being horizontal and diagonal, of different degrees of fineness. Having determined on the grain to be given to the photographic proof, the plate is inked with transfer ink and wiped in the usual way to removo the extra ink, and an impression of it taken on the prepared surface containiug the photographic proof at a copper-plate or other press. When the impression is dry, or partially so, it is placed up in a zinc tray containing water, in which some gum arabic is dissolved, heat being applied uuder the tray. The proof is allowed to remain until the water becomes heated; it is then taken up and laid face down on water at a lower temperature, when it will be found that the printed impression will leave those portions of the proof unacted on by the light. A gentle rubbing with a pieco of Canton flaunel or a camel-hair brush will leave the photographic proof in printer's transfer ink, in consequence of its adhesion to the insoluble lighted portions, and will retain the grain of the plate from which it was printed.

Sometimes we print on tho sensitive prepared surface an impression of the granulated plate, and afterwards expose to the light with the photographic picturo laid thereon; this gives a reverse grain to the printed proof. Wo also take impressions from grained stones and zinc plates prepared with lithographic chalk; and in some cases we place on the photographic picture an aquatint ground made of spirits of wine and resin to produce an even shading. Subjects represented by lines may be treated with an impression from a very fine grained plate on simply applying the ink diluted with turpentine with a silk dauber or brush and clearing away the superfluous ink with a clean rag, leaving no trace except the colour, enough remaining to answer the purpose of transferring to stone or zinc. We print by the process described a number of impressions of the same photographic proof. If it be desired to produce a coloured picture, each of those proofs have printed on their surface only those portions which represent a colour, with its registering mark placed at the side or other convenient place, and this we perform by covering over with gum-water and lampblack those portions which we do not want to print; or we obscure it by any other method capable of being easily effaced without injury to the photographic picture. Those impressions, when transferred to a series of stone or zinc plates, and printed in successiou on the same copy, will produce a coloured impression of the photographic picture; or the same may be performed by the process at present in use by lithographic artists for transferring the subject of the photographic picturo entire on a series of stones or zinc plates, which have their surfaces previously prepared to resist the greasy impression, and then by colouring with transfer ink on each stone or zinc plate the portion intended to represent the colour, and printing from them in their respective colours on the sheet of paper which has the registering marks printed thereon.

For the production of printing plates or blocks for surface aud intaglio printing, we use a material capable of having a polished surface made thereon, glass on metals, for example. We coat this surface with the transfer medium and sensitive coating already described; the thickness of the transfer medium is much greater and stronger than that used for coating the prepared surfaces already described; the thickness of the coating will determine tho depth to be given to the finished printing surface Wheu tho coatiug is dry, it is exposed in the copying frame with a negative or reversed negativo placed thereon; and when exposed sufficiently to tho action of tho light, it is carefully washed in water at a low temperature, which is raised gradually, using a little weak nitric acid in the washing; by gently brushing with a camel-hair pencil a clean proof is obtained. When a dry cast is taken in plaster-of-paris, to which is added a quantity of washed chalk, the cast may be metalized in the usual way and electrotyped; but wo prefer to harden tho cast by immersion in liquid silex, silicate zopissa, or aluminate of potash, when it will be found that the cast so treated will bear the pressure of the printing press, and proofs may be taken therefrom.

We obtain printing surfaces from photographic proofs by floating upon the surface of a metal plate (zinc we prefer) the sensitive coating alone, and when dry expose it to the light with the photographic picture laid thereon in a copying frame as already described; and when sufficiently lighted we cover the whole plate with an acid-resisting composition known to engravers, consisting of printer's varnish and asphaltum, to which lampblack is added; this is laid on with a printer's roller or dauber. When the composition is dry, or partially so, it is laid in water slightly warmed, when it will be found that the prepared varnish will leave all the unlighted parts of the photographic proof in an acid-resisting varnish, acid being applied, or the galvanic principle used to assist the action of the acid by stopping out the fine parts with varnish, as the action proceeds the photographic proof will remain entire upon the surface, while all the parts acted on by the acid will be sufficiently lowered to leave the printing surface in relief by placing in the copying frame a reversed negative in place of the negative; a plate in intaglio will be the result in the after-process as described above. The photographic picture used for these processes we take in the camera, with the plain side of the glass towards the lens, in order that the finished printing surface and the copy be alike in position.

Again, after having obtained a photographic image by the means already described upon any hard substance capable of being polished and of bearing a great pressure without injury, such as a slab of glass, marble, lithographic stone, or iron, we cover the surface on which the image or proof is obtained with lithographic printer's transfer ink, and wash away the unlighted parts. We take an impression of the inked proof on lithographic artist's transfer paper, with or without any further rolling, and transfer the impression thus obtained upon stone or zinc for printing.

In the transferring by light a photograph proof upon a lithographic stone by covering it with the sensitive solutions, the proof or transfer being made thereon and covered with transfer ink and washed, the resulting printing surface will not be durable for printing any number of impressions in consequence of the sensitive coating being interposed between the stone and the transfer ink. We remedy this defect and increase the number of impressions that can be taken from a photographic or other transfer on stone in the following manner:—After having washed and cleaned the transfer in the usual way known to printers by getting rid of the gum, we heat the stone and cover the surface on which the photographic transfer has been made with liquid silex, silicate zopissa, or aluminate of potash, or other liquid having a hardening effect upon the stone. When dry, it will be found that the surface, except the portions on which the photographic or other transfer is, will be much harder and less liable to attract the greasy ink than before. The photographic transfer is then rubbed out, brought up by methods known to printers; this will take away the sensitive coating, and brings the greasy ink into immediate contact with the surface of the stone, while the hardened portions will resist the action of the printing roller, producing a more durable printing surface with less labour; and where no sensitive substance or composition interposes between the stone and the transfer of a photographic or other proof, we wash the stone free from gum used in printing by known methods, and heat its surface, and cover it with the hardening solution as described, thus giving better results than are now produced.

Having now fully described and set forth the nature and object of our said invention of improvements in the production of photographic proofs and their application to printing purposes, and the manner of carrying the same into effect, we wish it to be understood that we do not limit ourselves to the precise details or materials herein described, as the same may be varied without departing from the nature of our said invention, nor do we claim generally the use of bichromate of potash as a chemical agent for the production of photographic results, but what we do claim is,—

First, the use of lithographic artists' transfer mediums or compositions, or other suitable transfer matters or their equivalents to coat surfaces for the production of photographic proofs as described.

Secondly, the employment of metal foils and surfaces free from granular texture, and the coating of them with gelatinous, farinaceous, and albumenized combinations or compositions, and the covering of same with the transfer medium or otherwise as described.

Thirdly, the coating with bichromate of potash in combination with dextrine, gelatine, or albumen, the prepared surfaces as described.

Fourthly, the admixture of pulverized mineral and earthy substances in the transfer compositions as described.

Fifthly, the printing upon the photographic proof a tint in lithographic ink by an impression from an aquatint plate as described.

Sixthly, the printing of photographic proofs in colours as described.

Seventhly, and lastly, the method herein described of producing printing surfaces in relief or intaglio from photographic proofs, and especially we claim the application upon the surface on which the photographic proof is obtained of an acid-resisting varnish on being washed, the proof alone remaining, the other parts being without the varnish covering may be easily corroded away, thus leaving the proof in relief; reversing the negative produces a proof in intaglio. We also claim the covering with lithographic transfer ink (any surface having thereon a photographic proof) then washing away the unlighted parts, and when clean taking an impression of the same on transfer paper, and making a transfer of it on lithographic stone, and the hardening of the surface of lithographic stones on which a transfer is made for printing purposes substantially as described.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 10th July, 1861.

M. Niepce de Saint-Victor has communicated to the Academy of Sciences some further researches upon the persistent activity of light, the result of which tend to prove that this peculiar action, whatever it may be, is independent of chemical agency, and that light is without magnetic influence. M. Leon Foucault that the peculiar action of light observed by M. Niepce de Saint-Victor is an invisible radiation which behaves like a gas, inasmuch as it does not traverse glass plates. The idea of its being phosphorescence cannot be sustained.

About a year ago you published an account of some interesting experiments which had been made here upon a new mode of obtaining gas for illumination, which gave hope that the odious monopoly of the gas companies, with all the attendant nuisances of gas works, and street gas-pipes would be done away with. Results of such magnitude and importance could hardly be expected to be arrived at suddenly, for however sound in principle, the maturity of the working details must require time. Of the ultimate success of the plan referred to there cannot exist a doubt. Meanwhile, a new candidate has entered the lists of competition. M. L. Chandor lately exhibited his gas generator before a committee of the Society for the Encouragement of the Arts, consisting of MM. Combe, Péligot, Gaultier de Claubry, Barreswil, Alcan, Tresca, and others; presided over by M. Dumas. In their opinion M. Chandor's discovery is of the highest importance, as may be imagined, when it is shown that by merely turning a stop-cock, a torrent of gas is discharged, which may be conveyed to the remotest parts of a building, and which is a continual source of light, heat, and mechanical power at any point of its course. The apparatus, of very small dimensions, was installed at the foot of the great staircase leading to the hall in which the sittings of the society are held. The gas-generator, a metallic vessel of about 20 inches in length, breadth, and height, contains about eight gallons of a liquid that is easily vapourized; a mixture of equal parts of oil of naphtha, and spirits of turpentine, purified by sulphuric acid, and distilled amid a current of hydrogen gas, which, while impregnating; lowers the temperature of their boiling point considerably. A drum constructed with valve-wheels, similar to an ordinary gas-meter, is mounted on an horizontal axis in the interior of the generator. The level of the liquid, maintained by well-known methods, rises a little above the centre of the drum, which receives its motion by spring or weight like clock-work, the power of which must be proportioned to the distance the gas has to be conveyed. The number of revolutions required averages about 100 per hour. The vessel, or generator, is pierced with two holes furnished with stop-cocks, one of which gives admission to atmospheric air, the other givess issue to this same air transformed into illuminating gas by the hydro-carbon vapours with which it becomes charged. An indian-rubber tube of suitable diameter receives the gas upon its leaving a little reservoir of about 10 inches square, and conveys it to the pipes of distribution. In the present experiment the length of these pipes was about 200 feet, but practically there are no limits to which the gas may not be conveyed by the application of suitable pressure. The gas was burned at jets of various kinds, and the brilliancy and steadiness of the flame left nothing to be desired.

The result of this interesting experiment proves that without the necessity of laying down pipes in the streets, or huge gasometers liable to destructive explosions, we can, by adopting this simple apparatus, illuminate buildings of any dimensions, churches, theatres, manufactories, workshops, and ships or steamboats. Moreover, the gas has no offensive odour, and leaves no foul deposits in the gas-pipes, as may be imagined when it is known that this gas consists of 90 to 95 per cent. of atmospheric air, and of 5 to 10 per cent. of vapourized hydro-carbon. The great problem which M. Chandor has solved is that of transforming atmospheric air which costs nothing by the simple addition of 5 or 10 per cent. of vapour into an excellent illuminating gas, which may be produced and burned at any convenient spot. The economy both of plant and material, is remarkable; and the facilities it offers in respect to local establishments may be judged when it is known that at two o'clock on the day of the experiment no preparations at the hall had been made, at seven it was in full operation.

PHOTOGRAPHY IN GERMANY.

Elberfeld, 6th July, 1861.

I have tried the nitrate bath with iodine, recommended by Abbé Laborde (as reported by your Paris correspondent in No. 147), and find it very excellent. I dissolved 40 grains of pure neutral nitrate of silver in 1 oz. of water, added some iodide of silver in order to saturate the bath, and then added 2 grains of iodine. After 24 hours the first negative I made with this bath was a very excellent one, the shadows being quite clear, and the lights dense enough; if the bath remains some time in the same condition, and retains its sensitiveness, I think this modification may be well recommended. Collodion-positives, also by this bath, become very clear and of a remarkable fine tone.

I see English artists are not very content with the classification given to photography by the Commissioners for the International Exhibition; but Prussian photographers also are not more considered, by their Government, as artists, and have for a twelvemonth passed had to pay a tax for carrying on a trade. The small photographic establishments have to pay £1 4s., the larger ones £2 8s. a year.

Dr. Schnauss publishes, in the *Photographisches Archiv*, some experiments on the *harmonization* of photographic solutions.

The collodion process, he says, possesses, when compared with the other negative processes upon paper, albumen, &c., an extraordinary subtilty or delicacy of photo-chemical changes. To these alone the high sensitiveness and beautiful results of the collodion process are due; but, on the other side also, are its great difficulties. The centre of gravity of this whole process, especially if rapid fine negatives are to be produced, lies in the exact quantity of the *acidifying principle* in the three most important solutions:—1. The *iodized collodion*. 2. The *nitrate bath*. 3. The *iron developer*. Because this *acidifying principle* can be neutralized by opposed agents possessing *alkaline* properties, we also must contemplate this latter class of substances when harmonizing our solutions.

In chemistry the acids and alkalies are especially characterized by the fact that the first redden the blue litmus, or the Georginen paper; the latter ones make the red litmus paper blue, or the Georginen paper green. But in photography there are much finer differences, which cannot be examined by the before-named test papers. The photographic forces themselves must be used to find them out, *i. e.*, a proof must be made. By this experiment we find amongst the photographic chemicals, especially in those which serve to iodize the collodion, two classes of a strongly-expressed polarity, or of photographic oppositions, the knowledge of which contributes very much to a sure operation. In the negative, as well as in the positive collodion process, the *acidifying principle* must *predominate* in a more or less high grade, according to circumstances. In the negative process *acetic acid* must be added to the nitrate bath and developer, in the positive process *nitric acid* is added to the bath, and acetic (or nitric) acid to the developer. In order to bring a small quantity of the acidifying principle into the collodion none of the strong acids may be used; we must here take the substances which are *only by photography* known as acidifying, viz., the pure iodine, or an iodide containing free iodine.

In harmonizing the solutions especially their *age* is to be brought into consideration. All three solutions being freshly prepared no good results can be immediately obtained with them. The amount of acetic acid in the bath and developer is then to be augmented in order to obtain clear, vigorous negatives. We give, in the following, some indications as to the best preparation of the three solutions, always supposing that they must reach a certain age or maturity before they are able to show their whole worth.

The *collodion* should be composed of good fresh prepared pyroxyline, and a mixture of two parts of ether and one part of alcohol. It must be good and evenly flow over the plate, it should not form any streaks (or it is too thick), but must possess enough consistency to hold the iodide of silver which is formed in it during the immersion in the nitrate bath.

The iodizing solution consists of

Alcohol (·835 sp. grav.) ...	... 1 ounce
Iodide of ammonium ...	... 24 grains
Iodide cadmium	... 12 "
Bromide cadmium	... 6 "

This solution should stand some days and obtain a wine yellow colour before it is used.

One adds so much of it to the collodion that the film becomes dense enough.

For the preparation of a good and homogeneous film of iodide of silver with the *etherial* collodion the amount of water is also to be taken into consideration. I have made some experiments in this direction which I will communicate shortly. All were made with samples of collodion of the same composition, only differing in the amount of water. Every sample contained 60 parts of ether, 40 parts of alcohol, 1 part of pyroxyline, 1 iodide ammonium, ½ iodide of cadmium.

Experiment 1.—The collodion contained ether of 0·725 and alcohol of 0·800 spec. grav. It dried rapidly upon the plate, therefore the iodide of silver film became somewhat uneven, also the film repulsed the nitrate solution; but it possessed a good consistency, and could be easily transported or transferred. It did not show any trace of streaks.

Experiment 2.—Ether of 0·734, alcohol of 0·803 sp. grav. Colour dark yellow, dried also rapidly, and showed neither streaks nor traces.

Experiment 3.—Ether of 0·734, alcohol of 0·803 sp. grav. Colour rather clear, always rapidly drying upon the plate, and of firm consistency. The negative proof was excellent, and showed, after drying, no trace of streaks. The film was very even. I think the amount of water contained in this collodion to be the best; when it is augmented, the colour of the collodion is light yellow, the film becomes very even, but after drying small streaks and traces appear, or the film splits up.

M. Angerer, of Vienna, has shown at the Photographic Society some enlarged visiting card portraits obtained with Woodward's solar camera. We hear he has expressly made the voyage to London to see Mr. Claudet's arrangements for enlarging, and this gentleman has shown and told him, with his well-known amiableness, all he knew about the subject.

In the same session Herr Leman read a paper "On the Copying of Imperfect Negatives." A very thin negative should be copied upon super-extra albuminized paper and through green glass in the sun. Too much strengthened negatives are copied in the sun, without green glass.

Hard negatives, with too great contrasts, may be copied in the sun upon plain salted paper, or upon albumenized paper, prepared as follows:—One adds to the albumen as much zinc-white as it may hold without giving a precipitation. The more zinc-white one takes, the more sensitive becomes the paper, and the more rich become the proofs. The albumen is salted with chloride of ammonium, diluted with water and applied to the paper with the aid of a brush. The *alkaline* reaction in the paper may be the cause of the augmented sensitiveness. Paul E. Liesegang.

OPTICS AND PHOTOGRAPHY.

Sir,—Among the many subjects which photographers discuss there is one that is almost always evaded; I mean the optical part of the science. There is a great deal said about lenses of different kinds, but there is a deficiency of information of a simple character, so that a person could be made to *understand* something about his lens. I do not ask for fine and learned descriptions; in fact, I would rather not have that sort of information, for it would still further bewilder: but I should like some gentleman to take up this subject and give clear and understandable descriptions of what a lens really is, and in what consists its real goodness. I am sure I express the desires of many other photographers in manifesting a wish for this desirable information. It is the privilege of photography that everything connected with it is subject to free investigation. The chemical and the mechanical portions are pretty well understood, but there seems a disinclination to go into the optics. I know that a great deal has been written, and valuable papers contributed to different societies, but these all seem to take too much for granted, and assume that people know so much beforehand, and which, generally speaking, I don't think they do. I want to be put in possession of this useful knowledge to enable me to understand these valuable papers. At present they are sealed books to me; I read them through, and try to persuade myself that I understand them, but I know I don't; and I am sure there are many more, who would not like to acknowledge it, who are very like me. I have read nearly all that has been written on the subject. Mr. Hardwich has enough in his book to bewilder one, but not sufficient to enlighten. Scattered up and down in Mr. Sutton's "Photographic Dictionary" are short articles, but they are not clear enough; and he writes as if his readers understood all about mathematics. Mr. Price in his book has some very useful remarks about the use of lenses, and makes some interesting comparisons between the human eye and a lens; but the information I seek for he does not furnish. A short time since I did think that I was about to obtain my long-sought knowledge from Mr. Rothwell, in the *British Journal of Photography*. The first article opened well. I was willing to forgive the pompous air with which the information was to be communicated, so that it only came; but the subsequent articles were so trashy, and moreover, in some portions, so full of error—for little as I know I could see that he knew nothing, or worse than nothing, about what he was talking—that my hopes all fell; for it was plain as noon-day that there was no good to be got out of him. I was surprised that Mr. Shadbolt permitted his *Journal* to be the vehicle of such nonsense. I was pleased to see that he did not endorse it with his name, but I still cannot understand why he inserted the articles at all.

Although the information has not yet been supplied, I do not despair, for I think when the want is made known that some intelligent gentleman will supply it, though who that gentleman will be I do not know; Mr. Sutton, I think, is well qualified to do it, but he has committed himself to so many vagaries that one would hardly have confidence in following him. I do not know whether we may expect any information from the professional opticians. A chemist might hesitate before giving a formula, for one might make his own chemicals, but one could not make their own lens. Mr. Grubb has written some good things, but I did not like his papers on the optical centre; I thought them dreadfully difficult to understand. Anything in that style would never do. Then there is Mr. Ross; he must understand the subject well. His father could write well, and he has been born in the profession. Mr. Dallmeyer, whom many consider the rising optician of the day, could he not popularize his own subject? He read a learned paper once; some people seemed to think there was nothing in it, there was a precious sight more than I could understand. There is Mr. Shadbolt, too, he is well up in this subject, and has moreover, a happy method of explaining matters. I wonder whether he would undertake this desirable task. As to Mr. Rothwell, well I think he needs to go to school as much as any of us, and the information will be singularly useful to him. Dr. Antony has already gone into this subject, and perhaps he would be the coming man.

I know no subject upon which information would be so cordially welcomed as on this one of lenses. The humblest beginner, and the most accomplished artist have their lenses as their tools to work with, and they should understand more than they do about them.

There is the glass itself, this is understood to be something very different to ordinary glass; some lenses are of crown glass, and some of flint glass. Then there is heavy crown and light crown, or is it heavy flint and light flint? Why are there always *two* lenses put together to make *one* lens? Then in a portrait lens—this, by-the-by, has *four* lenses, yet is spoken of as if it were only *one*—the two front lenses are put as close as possible together, fastened in contact, while the two back lenses are not only not fastened together, but are of quite different curves, and have a piece of metal between them to prevent them coming in contact. There is all the mystery, too, of chromatic and spherical aberrations, of refraction and diffraction, of astigmatism and I don't know what else beside. Then there are single lenses, double lenses, triple lenses, and for what I know, quadruple lenses. Then concave lenses and convex lenses, and double concave and double convex lenses, and meniscus and aplanatic, and positive and negative lenses. I want made clear to me all about these as well as the orthographic and orthoscopic and caloscopic and panoramic lenses. What is the relation between the diameter of a lens and its focus, and what is the rule, or is there a rule how far the back lens in a portrait combination should be put behind the front lens? Where should the diaphragms be placed—before, behind, or in the middle of the lenses? What shape should the diaphragms be, round, square, or oblong? Should they be put horizontal, vertical, or oblique, and why? About the focus too, is it to have depth or not? There is the old standing contest of large *v.* small lenses, and shall we have *blue* lenses? Is the vexed question quite at rest, of the necessity of coincidence of chemical and optical focus? These are all matters which, like most persons, I understand more or less, but upon which I require more clear and definite notions, and where to look for, or how to obtain this information, I don't know; and, therefore, I frankly state my want and hope to call the attention of those able to supply it.

A Photo Student.

[It is quite clear that our correspondent has read sufficiently to be aware of the nature of his wants: and we cannot help suspecting that knowing so accurately the points requiring elucidation, he has more general information about the whole subject than he confesses to possessing. The truth is, however, that practical information on photographic optics in a popular form is a decided want. But the authorities on the subject are at variance on many of the most important points; and those best acquainted with the subject are least able to popularise it; thus many difficulties are in the way. We shall return to the question shortly.—ED.]

A PHOTOGRAPHER'S CONTRIBUTION TO THE VOLUNTEER MOVEMENT.

SIR,—Any of your readers who have visited the Cascata at Tivoli will remember how, sorely to their annoyance, they were followed by crowds of mendicants, destructive of any peaceful enjoyment of the picturesque; and how on arriving at two or three stepping stones across some insignificant gutter, their charitable emotions were appealed to by "Io ho fatto quel piccolo reparagione," or "quel *pontisin* è meo, Eccelenza,"* In photography it is somewhat similar; any minute bridges to cross small difficulties are not only weekly claimed by their designer, but the most insignificant bone of that class becomes "of contention" between two or three rivals hurrying for distinction. Acting on these premises it may not be altogether uninteresting to your readers to note the fact that a photographer put the Rifle Volunteer into the grey uniform.

Treasurer to the "Metropolitan Rifle Club," of some five or seven years back, the quality of light grey enabling its wearer in distance to "walk invisible" was, to me, as an Artist, well known: the first grey uniform was mine, and was engraved and published by Ackerman of Regent Street, the lay figure on which it was drawn being—your obedient servant, LAKE PRICE.

Dictionary of Photography.†

PYROXYLINE, *or* SOLUBLE COTTON.—This is one of the most important substances used in the present practice of photography. It is formed by the action of nitric acid on lignine, or cellulose. Either linen, cotton, or paper may be subjected to the action of the acid, but cotton is most commonly used. Cellulose submitted to the action of weak nitric acid is dissolved; but when the acid is sufficiently strong the character of the cellulose becomes changed; instead of burning on the application of fire it explodes, and becomes soluble in a mixture of ether and alcohol, or in acetic ether, &c. In order to secure the acid of sufficient strength and in a convenient manner, it is customary to add sulphuric acid to the nitric acid, which, by absorbing the water present, increases the strength of the nitric acid. The result is also produced at times by the addition of sulpuric acid to nitrate of potash, by which sulphate of potash is formed, and nitric acid liberated. Pyroxyline is what is known by chemists as a substitution compound, the action of the nitric acid being to remove a certain amount of hydrogen, and substitute equivalents of peroxide of nitrogen. Without entering further into the theory of pyroxyline we will proceed to some practical details of manufacture and characteristics.

The simplest method for the amateur of preparing a small quantity of soluble cotton is that which was most commonly practised in the early days of the collodion process, namely, by means of nitrate of potash and sulphuric acid. Various formulæ are given for the practice of this method; in that given by Mr. Hardwich the proportions stand as follows:—

Oil of vitriol	6 fluid ounces
Dried nitrate of potash ...	$3\frac{1}{2}$ ounces avoirdupois
Water	1 fluid ounce
Best cotton wool	60 grains.

* "I made that little repair," "that little bridge is mine, your Excellency."
† Continued from p. 211.

The nitrate of potash should be reduced to a powder and dried before weighing, to insure accuracy. It is then put a little at a time into a jar containing the sulphuric acid and water which have been previously mixed, stirring with a glass rod until all the nitre is dissolved. The temperature, which will have risen considerably at first, should be allowed to fall to about 150° Fah., and the cotton, having been previously pulled out into tufts, is put into the mixture, pressing each piece with the glass rod to the sides of the vessel to secure perfect immersion and the contact of the liquid with every fibre of the cotton. After remaining in the mixture for ten minutes, the cotton is removed and thoroughly washed in repeated changes of water until all traces of the acid and of sulphate of potash are removed.

We have referred to the temperature, and before going further it is important to state that a thermometer, the bulb of which can be inserted in the acids, is of imperative necessity, as the exact temperature plays an important part in the preparation of pyroxyline. Thermometers properly fitted for the purpose may be had for about seven or eight shillings each.

The method of preparing soluble cotton by means of mixed acids is most commonly adopted where large quantities are required, and is also often preferred where a more complete command over the relative strengths of acids is desired so as to produce at will pyroxyline with certain specified characteristics. Mr. Hadow, in a paper before the Photographic Society, was one of the first to systematize the results obtained by varying the strengths of the acids employed; and notwithstanding the attention which the subject has received of late years, his paper may still be read with profit. The following extract contains some useful hints for adoption where acids of uncertain strength are used:—

"In using the mixed acids, the limits are the nitric acid being too strong, in which case the product is insoluble, or too weak, when the cotton becomes immedately matted, or even dissolved if the mixture is warm. I have availed myself of these facts in order to produce collodion-wool by the use of acids, without the trouble of calculating the proper mixture according to their strength. Five parts by measure of sulphuric acid, and four of nitric acid of specific gravity not lower than 1·4, are mixed in an earthenware or thin glass vessel capable of standing heat; small portions of water are added gradually (by half drachms at a time, supposing two ounces to have been mixed), testing after each addition by the immersion of a small portion of cotton; the addition of water is continued until a *fresh* piece of cotton is found to contract and dissolve on immersing; when this takes place, add half the quantity of sulphuric acid previously used, and (if the temperature does not exceed 130°, in which case it must be allowed to cool to that point) immerse as much cotton, well pulled out, as can be easily and perfectly soaked; it is to be left in for 10 minutes, taking care the mixture does not become cold, and then transferred to cold water and thoroughly washed; this is a matter of much importance, and should be performed at first by changing the water many times, until it ceases to taste acid, and then treating it with boiling rain-water until the colour of blue litmus remains unchanged; the freedom from all trace of acid is ensured by adding a little ammonia *before* the last washing. Cotton thus prepared should dissolve perfectly and instantaneously in ether containing a little alcohol, without leaving a fibre behind, and the film it produces be of the greatest strength and transparency."

The amount of solubility in ether and alcohol, the characteristics of glutinosity or limpidity, coarse structure or its entire absence, sensitiveness, intensity, and permanency, are all regulated largely by the strength and proportion of the acids and the relation of their strength to the temperature at which they are employed. Within certain limits pyroxyline made with weak acids and at a high temperature tends to give the greatest intensity, fluidity, and structurelessness to the collodion, the film being short and powdery, as distinguished from that which is tough or horny; and is most suitable for negatives. A lower temperature and stronger acids give a pyroxyline collodion, from which it gives a tough transparent film most suitable for glass positives. A higher temperature with strong acids has an analagous effect to a low temperature with weak acids; whilst a medium in both respects tends to give the greatest solubility. As illustrative of the effect produced by the strength of the acids, we know nothing more interesting than the following experiment suggested by Mr. Sutton in his little work on the positive process.

"Procure some dry cotton wool chemically clean, some pure sulphuric acid, S. G. 1·84, some pure nitric acid, S. G. 1·5, and some rectified sulphuric ether, S. G. ·750.

"Use the fire-place of an outbuilding for the experiments. Put an old frying-pan, filled with sand upon the fire, and in this sand-bath place a pie-dish containing water heated to about 170° Fah. Then procure a breakfast cup and a couple of long thick glass rods.

"1st Experiment.—Put into the cup

5 drachms nitric acid, by measure.
5 drachms sulphuric acid ,,
25 grains cotton wool.

"Dense suffocating fumes rise from the mixture; these should escape up the chimney. Keep working the cotton wool about with the glass rods for 5 minutes, during which time the temperature of the mixture should be 150°. The temperature of the water in which the cup stands being about 170°, that of the mixture in the cup will be as nearly as possible 150°; but you must test it with a thermometer, the ball of which can be inserted in the mixture; for the preservation of an even temperature is of the utmost importance.

"At the end of five minutes, remove the cup, throw away the mixed acids, and put the cotton into a pail of water. Wash it quickly, opening it well, and rousing it about in the water. Then continue the washing in a basin, changing the water several times, and squeezing the cotton after each washing between your hands.

"When you have thoroughly washed and squeezed out all traces of the acids in this way, pull the cotton out into a large loose ball, and hang it up to dry gradually in a clean piece of netting. The cotton, when dry, looks pretty much as it did at first, but you feel a peculiar harshness about it.

"The first experiment yields pyroxyline of the most explosive kind. Be careful, therefore, of accidents.

"Repeat the experiment ten or twelve times, adding in the second experiment 30 minims of water to the acids, and increasing the quantity of water added by 30 minims in each fresh experiment. The twelfth experiment will, therefore, contain, in addition to the acids 330 minims, *i. e.*, 5½ drachms of water.

"We will now suppose the various samples of gun-cotton to be dry, and ready for an investigation of their proprieties.

"First—weigh them.

Sample 1	will weigh 43	grains
,, 2	,, 43	,,
,, 3	,, 43	,,
,, 4	,, 42	,,
,, 5	,, 37	,,
Samples 6, 7, 8	37	,,

"The cotton having increased in weight from 75 to 50 per cent., according to the quantity of water added.

"We now proceed to test the solubility of these twelve samples of gun-cotton in ether, S. G. ·750, and also to ascertain the various properties of the film, produced when the solution is poured upon a glass plate. Observe that ether, at ·750, contains a proportion of alcohol and water; the S. G. of absolute ether being only ·720.

"Weigh two grains of each sample of gun-cotton, and test their respective solubility in half-an-ounce of ether.

"Samples 1, 2, and 3 will be found to be insoluble. Sample 4 looks more gelatinous, and seems inclined to dissolve. Sample 5 dissolves completely on shaking the bottle. Samples 6, 7, 8, 9, 10 are soluble; 11 partly so; 12 not at all.

"Now compare the different samples of cotton. The first three or four are long and fibrous, the next three or four are somewhat shorter, the last three or four become very short, and break up into little short shreds, many of which are lost in the washing.

"The first three or four samples are called "Pyroxyline," and the last three or four "Xyloidine." But it will be seen that this nomenclature is imperfect, for it does not include the middle varieties, which are those with which we are concerned in Photography, viz., Nos 5, 6, 7, and 8. We will call them photographic gun-cotton.

"The first samples of pyroxyline are highly explosive. Place a small tuft upon the hearth, and apply to it the end of a red-hot piece of iron wire. It instantly goes off 'puff,' without smoke, and leaving no ash. The last varieties of xyloidine are merely combustible, and not explosive.

"Let us next examine the nature of the solutions made with samples between Nos. 5 and 10.

"Pour a few drops of No. 5 upon the finger, so that it may run round both ways. It dries quickly (producing a sensation of cold), and when dry, contracts strongly, looking like a piece of goldbeater's skin, stuck tightly round the finger. This is the hard contractile collodion. Its use should be avoided in photography.

"Now pour a few drops of No. 10 upon the finger. This also dries quickly, but when dry does not contract like the former, and instead of being transparent, is semi-opaque, or "opalescent," or "papyraceous," looking like a piece of tissue paper stuck round the finger. This is also a kind of collodion to be avoided in photography.

"The proper variety of gun-cotton for photographic purposes lies between these extremes.

"In order to try which is the best, pour a little of each solution upon a clean glass plate. But in order to make the experiment fairly, wait a day or two, until the floating particles in the collodion have settled to the bottom of the bottle; for you cannot properly filter collodion without a special apparatus.

"Examine the films before a strong light, with the help of a magnifier.

"Film No. 5 is not only hard and contractile, but shows structure, being covered with wavy marks, or lines.

"Films Nos. 6 and 7 are much better, and are nearly structureless; No. 6 is the best.

"Film No. 8 begins to get slightly opaque.

"In films Nos. 9 and 10 the opacity increases.

"No. 6 is, therefore, the best collodion, and on adding a little alcohol to it, the appearance of structure in the film altogether vanishes. It adheres tightly to the glass, without contracting, and cannot easily be washed off."

(To be continued.)

Newcastle Photographic Society.—The monthly meeting of the Newcastle-upon-Tyne and North of England Photographic Society was held at the Weaver's Tower, New Bridge Street, on Monday night, Mr. Dewar in the chair. The secretary intimated that owing to the illness of Mr. North, the paper which was expected to be read on the construction of glass houses, with special reference to the arrangement of light was not forthcoming. A general conversation took place relative to the merits of the different dry processes, Mr. Dewar recommending the "honey" process, Mr. Mc Kie the "tannin," whilst Mr. Laws preferred the wet collodion to any of the dry processes. Mr. Birnie exhibited an apparatus for the cleaning of plates, which is considered to be useful. The meeting was adjourned to the first Friday in October, when it is expected that the members will come forward with a great many specimens of their workmanship during the vacation.

Talk in the Studio.

Methylated Spirit.—In the Committee on the Inland Revenue Acts, on Friday last, the Chancellor of the Exchequer moved—"That there shall be charged, and paid for, upon every licence to be taken out by any person not being a distiller, or rectifier of spirits, or a dealer in, or retailer of, beer, spirits, wine, or sweets, authorising him to sell methylated spirit in any quantity not greater than one gallon at a time, the duty of £2 2s." The resolution was agreed to. The effect of this will be, we presume, that methylated spirits may be purchased retail, which hitherto has not been the case: and as for many purposes it answers as well, whilst the price is less than one-fourth of that of pure spirits; this may be regarded as a boon by photographers.

French Photographers and the Exhibition.—The French Photographers are disposed to resent warmly the proposed classification of photography. The Paris correspondent of a daily contemporary remarks: "The French commission for the Exhibition of 1862 has prepared forms of application for intending exhibitors, and has appointed seven places in Paris for their distribution. The chief office is in the Palais de l'Industrie. In connection with this subject, I may mention that the photographers here are exceedingly displeased with what they understand to be the decision of the English commission relative to the classification of their productions with the instruments by means of which they are produced. They say very pertinently that silks are not put with looms but with similar products, and therefore that photographs should be placed with engravings and lithographs. Some of the best photographers declare that they will not exhibit unless an alteration is made in the plan. Perhaps the matter only requires a little explanation, and I therefore merely report facts for the consideration of the commission."

Photography a Detective.—The various metropolitan police courts have recently been adorned by the aid of photography. We have before heard of the practice of photographing criminals when in custody with a view to a subsequent identification; but we have not seen such portraits forming part of the placards announcing a reward for the apprehension of persons "wanted." An absconding bankrupt, whose portrait, from the *degagée* deportment has manifestly been taken with far different intention, now smiles amiably, hat in hand, upon all who read the notification that one hundred pounds reward will be paid upon his apprehension.

The Comet.—Mr. Warren De La Rue, speaking of this unexpected and unrecognized astronomical visitor,—"I made an attempt on the 2nd to obtain a photograph of the comet in the focus of my reflector; but not the slightest impression was produced by an exposure of two minutes, although a fixed star was clearly depicted. Yesterday, the 3rd, I made several attempts to photograph the comet by means of Ross's No. 3 portrait lens mounted on the top of my telescope, and carried round by clock-work,—not the slightest trace of the comet was depicted in fifteen minutes, although the fixed stars were depicted. As Donati's Comet was photographed by similar means in seven seconds (not by myself), it follows that the present comet is considerably less actinic than Donati's." The *Athenæum* says—"We have seen other attempts made to photograph the comet, but without success. The contiguous stars left a strong impression on the prepared glass, but the comet itself left no trace of its presence."

To Correspondents.

R. G.—We presume that the markings to which you refer, are the irregular and indefinite cloudiness in the sky. It is somewhat difficult to come to a decided conclusion, from a print, as to the cause of somewhat indefinite markings in the negative, but we can suggest the probable causes. It sometimes happens that markings actually in the film, from some cause, such as a dirty plate, irregular development, &c., are not apparent before intensifying, but become very decided during that process. Another very common cause of stains, where intensifying after fixing and drying is adopted, is imperfect washing of the film before drying. Some slight trace of the fixing salt is left in the film, and when the solution of iodine, followed by pyro and silver is applied, irregular action becomes very apparent. In some cases, and with some collodions, when the intensifying is conducted after the plate is dry, irregular action arises from irregular absorption of moisture, where the stream from the tap falls heaviest, or where the developer is poured, absorbs, because of the mechanical force of the stream; and is repelled, or not readily absorbed, at those parts where the mechanical force is absent. Use one grain of iodide of potassium to one grain of iodine instead of two.

A Puzzled One.—The portrait of a gentleman is fogged from under-exposure and using a dirty plate. The stain on one side of the plate containing a portrait of a lady is also from a similar cause. There is, however, a tendency in your chemicals to the ready production of stains. A 40-grain bath requires to be decidedly acid, or there will be a tendency to stains. A new or colourless positive collodion frequently has a tendency to give stains, and may be remedied by the addition of a few drops of tincture of iodine. A little more acetic acid in your developer, and a little less iron when the weather is hot would be an improvement.

T. A. L.—The lens to which you refer is distinguished by admirable depth of focus. The utmost definition that ought, with due regard to ærial perspective, to be found in distant objects, is given by it. We have recently been trying it, and have two of the views before us now. Without any perceptible loss of crisp definition in the foreground, we have a well-defined but atmospheric middle and extreme distance. The results are highly satisfactory to all who have seen them.

Excelsior.—Lerebour's lenses are considered very good as French lenses; but they are not equal to those of the best English makers. The price mentioned, however, is quite out of the question. The price, as quoted in the lists of various London dealers for the quarter-plate size, is about £2 10s. The sum you mention, £4 10s., is more than the price of the half-plate lens. The stops which fit into the hood are intended for use in portraiture, when the light permits their use, and also for copying, &c. We should scarcely expect the compound lens to be suitable for landscape work; and we cannot tell you whether there is any arrangement for using the front lens for that purpose. If it be, as you describe, a quarter-plate lens, you will only be able to take pictures 4¼-in. by 3¼-in. The Jamin lens take larger pictures when the central lens, which shortens the focus, is removed. Sometimes portrait lenses may be used for landscape work, by the insertion of a central stop; and many portrait lenses are now made with an arrangement, whereby the front lens may be removed and used alone as a landscape lens. We cannot tell you where to get Lerebour's price list, except from Paris; but you will find his lenses quoted in the lists of various London dealers. The last two volumes of the Photographic News consist of the numbers issued during eight months; at present we see no reason to change that arrangement, in which case the present volume will be complete at the end of next month.

W. H. Fox.—The poisonous effects of cyanide of potassium are so rapid, that it is rarely possible to counteract them. Sulphate of iron, which is always at hand in the operating room, is the antidote which should be taken without a moment's loss of time; and if taken at once, the cyanide will be decomposed. Details will be found under the head "Scientific Gossip," in the Photographic News of May 3rd.

F. E. G.—We are sorry to have disappointed you in not attending to all your questions; but the simple truth is, that we cannot always with certainty make out your writing. In ordinary matters we can guess the meaning; but when we receive a statement of unusual occurrences or difficulties so we are puzzled; and after making our head ache, with the endeavour to decipher, or guess at the meaning, we lay the document aside for a more convenient season, which we are bound to confess does not always arrive. Will you be so good as to restate the points where you stumble, and we will once more try to help you. The stereo lenses you name are magnificent for stereo work; and they may be used for carte de visite; but they will not cover perfectly for a standing figure A proper lens is necessary for that purpose.

Dr. B. W. Switzer, Moradabad, East India.—Our German correspondent, Herr Liesegang, believes that the chemicals you used for the arrowroot paper were not pure enough. The best preparation for it is the "Real Brazilian Tapioca," potato flour cannot be used. The arrowroot solution as well as the nitrate should be somewhat acidified by citric acid. Then the paper remains quite white after the bath. We have often heard that pure chemicals and papers are very difficult to be obtained in India, as you state. We shall be very glad to receive the pictures you speak of.

A Photographic Printer.—Your difficulty most probably arises from the paper. Some samples of paper require toning much deeper than others, on account of the great loss in the toning bath. Excess of alkalinity in all or any of the solutions has a tendency to make the print turn a brick-dust colour in fixing. See that your silver bath is the full strength and a little acid. Let the toning bath be just neutral and tone sufficiently deep. The fixing bath should also be neutral, not alkaline. The gold toning bath with acetate of soda, as given in the Photographic News Almanac, has a tendency to prevent the defect of which you complain. Try it: we have had many excellent accounts of its value. The hypo, which you say is a fresh sample, may possibly be very alkaline; try it; and if so, discard it. If you wish to test its purity, weigh 20 grains of it accurately, and dissolve in half an-ounce of water; then take 10 grains of iodine, and powder. Add this to the hypo solution, shaking well. If the hypo be pure, the iodine will dissolve and disappear; if any of the iodine be left undissolved, the hypo is impure just in proportion to the amount of undissolved residue.

John Thorp.—In developing dry plates there is no necessity for alcohol in the developer. Alcohol is used in the developer for wet plates simply for this reason: the nitrate of silver solution on the surface has, in the course of exciting many plates, acquired a little alcohol and ether, and in order to make the developer flow easily, and combine at once with the solution on the plate, it should have just a similar quantity of alcohol. In dry plates there is only water on the plate, which should wet it thoroughly before applying the developer, which should only contain water, it will then combine with the water already there, and flow freely. Where it does not do so, it is want of a little more skill or care in the manipulation. Alcohol would only make the matter worse. We are glad to hear that the News is of so much value and interest to you. It is our aim that it should be so to all; and it is gratifying to know that we gain that end.

W. D. B.—There must necessarily be some trouble in applying a spirit varnish to a pane in a window, whilst in its place, on account of the difficulty of applying the requisite heat. There are two ways of getting over the difficulty. One is to heat the pane by holding a hot flat iron as near to it as you can do safely. The other, to take a piece of glass the size of the pane, and varnish it with the yellow varnish. Then fix that up with a brad or two against the pane already there.

C. E. L.—The circle of light in your stereographs is caused by the use of too small a stop. The No. 6 stop to which you refer is only intended for copying. The stop marked X is small enough for almost all practical purposes. The pictures always lack relief and boldness when a very small stop is used, and look flat and "adhesive." See recent articles on "Sharpness" and "Depth of Focus." Shading the lens with diffused light will also remove the circle of light.

Homo, Tannin, and some other correspondents next week.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 150.—*July* 19, 1861.

PHOTOGRAPHY AND THE EXHIBITION OF 1862.

The question between photographers and Her Majesty's Commissioners for the International Exhibition of 1862 still remains open. The *Journal of the Society*, published on the 15th, devotes a large space to the subject generally, and to the replies of the various societies, provincial and continental, with whom the secretary had communicated. We regret, however, that the official information does not seem in all cases to be brought up to the latest period. The Editor of the *Journal*, speaking, we presume, the sentiments of the Council, maintains that unless the concessions demanded by the Council be complied with, the Society must still decline in any way to co-operate with the Commissioners. Referring to similar views of the matter to those which we promulgated a few weeks ago, he remarks, "there are those who are for appointing a committee of persons who, by energetic and united action, and protest, might eventually accomplish what all seem to think desirable. But to this we have to say, that it would scarcely be dignified on the part of the Council, or courteous to the Commissioners, to undertake a position which is false and antagonistic at the commencement." Referring to the misfortune which it would be if photography were either imperfectly represented, or not represented at all, the *Journal* remarks, "the onus of this must fall upon those who force photographers to abstain, by a pertinacious persistence, in a classification which they themselves acknowledge to be wrong." We are not about to enter into discussion of the matter at the present moment, but we cannot let this pass without remarking that we were not aware that the Commissioners had anywhere acknowledged the classification to be wrong, and repeating what we before remarked, that in the case of such non-representation, or worse than that, inadequate representation, whilst the error will unquestionably be that of the Commissioners, the loss will be, at least to a very large extent, that of photographers and their art.

We shall now proceed to lay before our readers brief abstracts of the replies which have been received from the secretaries of the various societies to whom communications were made.

M. Laulerie, Secretary to the French Society, writes to state that the matter will be laid before the society, and, in the meantime, states that he has called upon the Commission, charged with the general organization of the French department of the Exhibition, who decidedly recognises the classification of Her Majesty's Commissioners as a philosophical blunder, and states its conviction that a special place will eventually be reserved for photography, under conditions the most suitable, and that in this place will be brought together the photographic works of different countries. This arrangement, it will be seen, is in accordance with that we have recently recommended. It is somewhat singular that as M. Laulerie writes under date the 18th of June, and states that he will lay the matter before the meeting on the 21st of June, which he did, we have no official account of their decision in the Society's *Journal*, published three weeks after that date.

Mr. A. F. Adam, Secretary to the Photographic Society of Scotland, states that the council of that society, whilst heartily concurring in the steps hitherto taken by the parent Society, "ventures to doubt if the course now proposed to be pursued," that is, the entire abstinence from contributing photographs. "is that best adapted to further the object which we all have in view, that of a proper representation of the art of photography." He adds:—

"It rather appears to us, notwithstanding the unsatisfactory nature of the Commissioner's replies, that further consideration of the subject is not absolutely foreclosed, and that the appointment of an influential committee from your Society might be one of the best, if not now the only, means of attaining our object."

Sir David Brewster, in his capacity of secretary of the Photographic Society of Scotland, writes to the Commissioners, maintaining the right of photography to a position amongst the fine arts. He concludes, somewhat inconsequentially, by remarking that "photography is yet in its infancy, requiring all the aid which chemical and optical science can afford it, and that any influential refusal to give it its due place among the fine arts must have an unfavourable influence upon its future progress." We fear that Her Majesty's Commissioners will scarcely regard the emphatic statement of its need of aid from science, as the strongest argument for admitting it to a place among the fine arts.

Mr. C. Heisch and Mr. J. Glaisher president and vice-president of the Blackheath Society, state that the council of that society entirely endorse all the acts and opinions on the subject published by the parent society.

Mr. A. H. Wall, secretary of the South London Society forwards a resolution, which we had the pleasure of moving at the last meeting, concurring in the steps already taken by the parent society, but suggesting that if it should be eventually deemed prudent, in lieu of any more satisfactory arrangement, to accept the separate department for apparatus and pictures offered by Her Majesty's Commissioners, that it be accepted under protest against cataloguing photography in any position which does not recognize it as a fine art.

Mr. J. Barnett, secretary of the North London Photographic Association, has communicated by letter on the subject, with the various officers of the society. The answers are classified as follows:—

"For placing photographs with the apparatus used in their production	1
"For placing photographs in a separate room in juxtaposition with that containing apparatus	2
"For placing photographs in the 'Fine Arts' department, and opposed to any compromise on the part of the Commissioners	6
"Indifferent	2
"No reply from	1
	12"

Mr. J. Cramb, secretary of the Glasgow Society, states that a special meeting having been called, the society "homologates" the hitherto published doings of the parent society, and has confidence in leaving the matter in their hands.

Mr. J. F. McKie, Secretary of the Newcastle Photographic Society, states that a special general meeting of that society entirely endorsed the published acts and intention of the London Society.

Mr. W. G. Thompson, Secretary of the Bradford Photographic Society, writing under date 13th June, states he will call a meeting of the society on June 17th, to consider the question, and will then report the result of their deliberations. No report of the result of the meeting is, however, published.

Mr. W. T. Mabley, Secretary of the Manchester Society, states that it was resolved at a recent meeting that the course pursued by the Society had the approval of the meeting, and that the members would join in remonstrating against the slight offered to their art.

The Birmingham Society are of opinion that the proposed classification is unfair, uncourteous, and unjust, and approving of all the London Society has done, agrees with it in urging upon all photographers the necessity of refraining from exhibiting or taking any part in the International Exhibition, until a more equitable position is assigned to photography as an art.

The Edinburgh Society having considered the subject at a recent meeting, empowered their Council to draw up a remonstrance against the classification.

Professor Playfair again writing on the subject, and considering the offer to give photography a separate department, after admitting the existence of certain difficulties on the subject, concludes by saying:—

"If the Commissioners were right in giving to photographers a separate class, then it can only be associated with Fine Arts on any principle of classification, although the difficulties will be felt of including in the section certain kinds of photographic pictures which cannot properly be considered to belong to Fine Arts."

Mr. T. D. Eaton, writing in reply to the communication forwarded to the Norwich Society, after stating that the Society is defunct, gives his personal opinion, containing some sensible remarks. He concludes by saying:—

"Before the Council take the strong step they seem to contemplate, it may be well to consider, whether their recommendation will exclude photographs entirely. If not, surely the art had better be fully represented (if not fairly), than partially and faultily."

We shall conclude our extracts from this correspondence, which largely represents public feeling on the subject, by the two following letters. The first is from M. Silvy.

"38, *Porchester Terrace, Bayswater, W.*
"*June* 4, 1861.

"DEAR SIR,—I have seen in the last number of the *Photographic Journal*, the difficulties arisen from the classification proposed for photography at the International Exhibition of 1862, and the claims put forth by the members of the Society to which I have the honour to belong.

"Notwithstanding the respect I feel for the opinion expressed by the honourable president, I must confess that mine is totally different, and that I have demanded from the Commissioners the favour of having my productions exhibited in the special mechanical department.

"However interested I may be in seeing photographic productions (to which I have been long devoted) highly estimated, still I cannot hide from myself that the chief merit is produced by the wonderful means that science has placed in our hands; and since I am in a country renowned for its horses, allow me a comparison which, I think, develops my idea:—

"Would the constructors of locomotives be right to enter their engines for the Derby in order to compete with thoroughbred horses?

"Such an idea has never been thought of, and I consider that the genius of photography will suffer no disparagement in being placed amongst the most wonderful machines which this era has yet produced.

"Should the members of the Society determine to send a collective note claiming another place than that indicated by the Commissioners, I regret much that, not having the same opinion, I shall feel obliged to withdraw myself from a Society of which, till now, I have had the honour to be a member.

"In begging you to lay my letter before the Committee, I remain, sir, yours, &c. C. SILVY."

Whether any other motive but a desire to be odd or bizarre can influence M. Silvy, who is himself eminently an artist-photographer, we leave others to determine. We conclude by the following letter from Mr. Lake Price, who is a still higher authority, as an artist and artist photographer.

"SIR,—It is no doubt supererogatory to attempt to add one word to the able arguments advanced in the admirable letter of the respected president of the Photographic Society of London, which indeed exhaust the subject. Still I may be allowed, as an artist and as a photographer, to express the extreme surprise I felt on seeing that in the programme for the International of 1862, the photographic lot was placed in the closest contact with 'Scarifiers!' and 'Clod Crushers!' hauled up along aside 'Ships' Tackle!' and estimated *pari passu* with the excellent cabinet work of the makers of our cameras. My own resolve was instant, not to accept the position. I maintain that in the hand of those whose artistic study enables them to know what they 'are going for,' the camera is as certain and legitimate a means of producing the desired result as the pencil itself, and that *the intention and thought of the individual is repeated in his works.*

"Now, apart from all questions of scientific study of optics and chemistry, of taste and knowledge of artistic requirement, it appears to me that the foregoing fact, clearly established as it has been in the works of many photographers, settles the question. If the producer can so mould the result to his will and to his preconceived design, can convey to the mind of another the *intention* of the picture, can make it satisfactory in composition and in *chiaroscuro*, it is decidedly NOT A MECHANICAL PRODUCT, and would, therefore, be clearly misplaced amongst its proposed fellows.

"I have no doubt, from the general feeling expressed, that, if the intended classification is insisted on, there is not one photographer, English or foreign, having the least pretension to be called an artist, who, by being found amongst the exhibitors in the section, will brand himself as a 'MECHANIC.'

"The entire absence of the most interesting results of one of the wonderful discoveries of our times will be a loss to all; but infinitely better thus than that it should be degraded by such unworthy association.—Yours, &c.,
"LAKE PRICE."

Notes and Jottings.

No. 8.

INTENSIFYING NEGATIVES WITH BICHLORIDE OF MERCURY AND IODIDE OF POTASSIUM.

AT page 293, Mr. Elliot gives the result of his experience in the strengthening of weak negatives by means of bichloride of mercury and iodide of potassium, and the process having now received a fair and full trial in our hands, we are desirous of adding our testimony to its excellence.

In photography, as in everything else, however closely persons may approximate in their general results, it will be found that in points of detail they differ more or less; and, therefore, it is very desirable that each should add his mite of experience to the common fund of knowledge. Commenting on Mr. Elliot's paper, we wish to drop in our small contribution.

The collodion should be of the strongly adhesive kind, bromo-iodized, and giving a moderately intense image on developing by iron alone. Should the collodion be over bromized it will be found that pyrogallic acid will be necessary in order to attain the proper intensity before applying the mercury and the iodide. A certain degree of intensity *must* be attained in the first instance, when the ordinary method of using these solutions is adopted; for, if the image be only brought out as a positive, the intensifying can only be carried to a limited point, and the negative will be weak and unsatisfactory.

By using the solutions *warm*, however, a great increase of energy is got, and many negatives taken in a weak light, and which would otherwise be useless, may be preserved. Even if cold it will be found that repeated alternate applications of the solutions, with copious washing between, will enable you to push the intensity further than by the method adopted by Mr. Elliot.

The plan we commonly adopt in manipulating is as follows:—As above stated, a moderate amount of intensity should be got in the first place. We prefer cyanide of potassium in fixing, after which the plate should be *well washed* and allowed to dry spontaneously. It is of the first importance that the film should be quite dry before proceeding further.

Our solutions for the second intensifying are:—

1.	Saturated solution of bichloride of mercury	1 fl. oz.
	Water	2 „
2.	Iodide of ammonium	4 grains
	Liquor ammonia	4 or 5 drops
	Water	1 ounce.

First wetting the film, the bichloride solution is poured on, and allowed to stand for about half a minute, and then returned to the measure. Washing the plate, the iodide is then poured on in its turn. By proceeding thus two or three times the proper degree of intensity is attained gradually, and we can stop it at the desired point.

The action of the bichloride should not be continued too long at a time, unless a *yellow* negative be desired. Generally, we may state that if the bichloride be applied last, the deposit will partake largely of the orange or yellow; if the iodide, prepared with the addition of a few drops of ammonia, as recommended above, the colour will be of an orange brown, enabling you to judge better its printing qualities.

Mr. Elliot recommends the application of varnish round the edges to keep the film on the glass. This ought not to be necessary; but we are aware that there is great difficulty in procuring collodion of sufficient tenacity. Nevertheless, the addition of four or five drops of water to each ounce, will often make a collodion very adhesive that would otherwise wash off. We prepare our pyroxyline at a moderately high temperature and weak acids especially for this purpose, and find no necessity for such a precaution as that recommended by Mr. Elliot.

We had purposed saying a few words on the application of this process to dry plate photography, but must leave that for a future "Jotting." Michael Hannaford.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

The Inorganic Acids.—It has been considered best to conclude the account of the different chlorides, bromides, iodides, &c., employed in photography, before noticing the corresponding hydrogen compounds of these metalloids. These compounds forming a well-marked group by themselves, and, consequently, admitting of more convenient study together, than if taken with the metallic salts. First in general importance, if not in actual photographic value, stands—

Hydrochloric Acid.—This acid is invariably made in commerce by the decomposition of sea salt by means of sulphuric acid; an operation which is one of the stages of the process for the manufacture of carbonate of soda. A mixture of one atom of common salt with one atom of oil of vitriol is heated in a horizontal cast-iron cylinder by means of a furnace; the anterior part of the cylinder is furnished with a tube through which the gaseous hydrochloric acid is conducted into a series of two-necked bottles half filled with cold water. The acid upon its evolution from the cylinder is allowed to traverse a long brick channel built slightly rising, through which a gentle stream of water is allowed to trickle down and meet the gas. Owing to the great avidity with which hydrochloric acid gas dissolves in water it is condensed by the stream and flows into proper recipients. Thus prepared, hydrochloric acid is very impure. On the small scale, or if required for photographic or chemical purposes it should be prepared in a slightly different way. A large glass flask should be connected by means of glass tubes and corks with three Woulfe's bottles (two-necked glass bottles) so that gas proceeding from the flask may bubble successively through each bottle. In the flask place 8 parts of common salt, and then pour upon it a cold mixture of 13 parts of oil of vitriol and 3 parts of water. The first bottle should have poured into it a very small quantity of water, the second bottle a quantity of distilled water, about equal in weight to the common salt employed, and the third bottle should contain a somewhat less quantity of water. The flask is then to be heated over a sand-bath until no more vapours are evolved, the temperature being gradually raised towards the end of the operation to nearly a red heat. The gaseous hydrochloric acid, with several impurities, will bubble through the bottles of water, which should be placed up to their necks in a vessel of cold water, and have moistened cloths on their necks to prevent a rise of temperature; the first bottle will collect the aqueous vapour evolved from the mixture, and will also serve to fix the less volatile impurities such as selenium, arsenic, tin, or iron. The water in the second bottle will be converted into about half as much again pure or nearly pure hydrochloric acid of a specific gravity, 1·145, whilst the third bottle will contain what little hydrochloric acid has escaped absorption in the second bath. This may be concentrated in a subsequent operation by placing it in the second bottle.

Pure hydrochloric acid, when perfectly free from water, is a colourless gas, which fumes strongly in moist air, has a peculiar, suffocating odour, and reddens litmus strongly. It is absorbed with violence by water with considerable rise of temperature. At the ordinary temperature water absorbs 480 times its volume, or nearly its own weight of the gas forming a solution of specific gravity 1·2109. The aqueous acid, when pure, is colourless, the crude acid, however, is generally of a yellow colour, owing to the presence of chlorine, iron, organic matter, &c. It fumes in the air, boils at a lower temperature than water, giving off the gaseous acid; the boiling point rising until a liquid is obtained containing 20 per cent of acid. It has a very pungent, acid odour, smelling like saffron when it contains iron.

The impurities of hydrochloric acid, especially the commercial unpurified variety, are numerous and important; even the so-called pure acid is liable to contain some of them; consequently, if the operator really desires to know if he has perfectly pure acid, it should be tested for each of the following contaminations:—sulphurous acid, sulphuric acid, chlorine, nitrous acid, arsenic, tin, or iron.

Sulphurous acid is produced by the sulphuric acid acting on the iron cylinders in which the crude acid is made. It is readily detected by adding to the aqueous acid a mixture of a little protochloride of tin, and twice its bulk of water. If sulphurous acid be present the liquid becomes turbid in a few minutes, appearing first yellow, then brown, and finally depositing brown sulphide of tin. *Sulphuric acid* is detected by diluting with four times its bulk of water, and adding a drop or two of solution of chloride of barium. If there is formed a white precipitate, or even milkiness in the solution, sulphuric acid is present. If the solution, filtered off from this precipitate, and boiled with a little nitric acid, gives a further white precipitate, it shows that sulphurous acid is present.

Chlorine.—This impurity is not at all an unfrequent contamination of hydrochloric acid. It is produced by the sulphuric acid containing nitric acid, or the common salt being contaminated with a nitrate. It may be detected by the yellow colour which it communicates to the liquid; by its peculiar odour; or by its bleaching properties. If a solution of sulphate of indigo be added to it, the blue colour will disappear. Chlorine likewise causes the precipitation of sulphur from hydrosulphuric acid when an aqueous solution of the latter gas is mixed with dilute hydrochloric acid containing this impurity.

Nitrous acid is best detected by mixing it with its own bulk of oil of vitrol, allowing the mixture to cool, and then cautiously pouring on to the surface of the liquid a strong solution of sulphate of iron, taking care that the liquids do not mix. A red colour is formed at the common surface of the two liquids, which may be caused to reappear after it has faded, by slight agitation.

Arsenic in the form of chloride is frequently, indeed, almost invariably, an impurity in hydrochloric acid. It is derived from the sulphuric acid. It may be detected in several ways. When the acid is diluted with water and mixed with sulphuretted hydrogen, yellow flakes of sulphide of arsenic are produced. When nitric acid is added, and the liquid evaporated to dryness, the metal is left behind in the form of arsenic acid. To purify the acid from arsenic, the best plan is to precipitate with sulphuretted hydrogen, and to filter the yellow sulphide of arsenic from the hydrochloric acid by passing it through asbestos; paper would not do, as it would be disintegrated by the strong acid. *Tin* may also be present in the form of chloride; it arises from binoxide of tin being present in the oil of vitriol. It is detected by the brown precipitate produced upon the addition of sulphuretted hydrogen; upon standing for some days the precipitate settles, and may be filtered off. It yields a globule of tin before the blowpipe. *Iron*, as well as *lime*, *soda*, and other fixed impurities may be readily detected by evaporating the acid to dryness at a gentle heat. No residue should be left if pure. If, however, there be a residue, its nature may be ascertained by dissolving in water, and adding appropriate tests. Thus, ammonia will precipitate iron in the form of a brown flocculent precipitate; the solution filtered from this will contain the lime which may be precipitated by oxalate of ammonia. The proper analysis of such a residue of this will, however, require the appliances of a good laboratory, and the knowledge of an experienced analytical chemist, and cannot, therefore, be attempted with any hope of success by one who has only a superficial knowledge of chemistry.

The Technology of Art as applied to Photography.

BY ALFRED H. WALL.

Sentiment.—To imitate with no other motive than imitation, and to imitate in order to express sentiment, will constitute no small difference. In the one case, the operator will make his selection, choose his exposure, and regulate his development with one idea, viz., that of securing the best possible imitation; in the other, selection, exposure, and development will all become subservient to some leading sentiment, the expression of which will constitute the picture. In either case entire truthfulness may exist, but while in the one production that truthfulness stands alone, in the other it blends intimately as it were with something more spiritually powerful, and not only expresses the simple forms of nature, but the soul of the artist. The picture is no longer dumb, but speaks with an eloquent tongue to every spectator; it has become endowed as it were with a mission, and spreads its influence among us far and wide, while the purely imitative production lives and dies in the first inspection, and however beautiful and rich in minor qualities, shows poor and mean by comparison with its mightier rival.

Shade and Shadows.—Surfaces which are not exposed to direct light are in shade but where projecting features shield certain parts from light more effectually, we term such shadows, or "cast shadows." The forms of cast shadows of course depend on the surface they are received upon, and the shape of the projection said, technically, to cast it. A scene will vary very surprisingly as the light falls at different angles, and the length and shape of the cast shadows become altered during the day. That which was devoid of any one quality of the picturesque at noon, becoming perhaps full of sentiment and beauty as the lengthening shadows and varied lights indicate the approach of evening. The effect of shade or shadow, therefore, should be duly studied when selecting a view, &c.

Simplicity.—Unartificial productions without exaggeration or affectation, which aspire only to the expression of the more familiar objects, scenes, and incidents of life, are said to possess this quality.

Studies.—Photographers have not perhaps been encouraged sufficiently, or no art could equal theirs, for producing studies of parts for pictures. I have already pointed out how valuable such from the nude must be, and in fact are, inasmuch as Rejlander and Robinson in common with myself and very many others, have executed such: moreover, photographic studies of heads, hands, and feet, of foliage, and foreground plants, of rocks, &c., have been frequently published, although, as a rule, operators do not give much attention to the production of such. In one of my papers from a common-place book, I pointed out how valuable even to the student of photography such studies would be, if regarded as an introduction to the practice of the art; and as those remarks more particularly applied to landscape, I may add that even in reference to portraiture, separate studies of heads, hands, and drapery would be no less important to progress in an artistic direction. The photographer would then learn what constituted perfect photography in reference to each of these as parts, and be the better able to consider the treatment they should receive in order to be well combined as a whole.

Subordination.—In Fairholt's dictionary of terms in art a very good illustration of the value of subordination is given. "Take as an example of gradation (subordination) the arrangement of rooms in a palace. We enter a simple vestibule, and pass thence to the ornamental ante-chamber: next we see the beautiful reception-rooms; and beyond these we find splendidly-decorated apartments. Without this gradation, no growing impression would be made upon our feelings."

Supple.—A pose which conveys an idea of flexibility instead of rigidity and stiffness.

Sweetness.—Mingled *clearness*, *simplicity*, and *harmony* are frequently indicated by this term, but I must confess I have no very clear idea of what it actually does mean, although I can pretty well understand the kind of picture it would be employed to describe.

Symmetry.—The fitness of parts in connection with the whole, or harmony of proportion.

Taste.—Displayed in practice by the harmonious perfection of various qualities when in combination and in theory, by the appreciation of the same. A cultivated and refined taste is about the finest thing you can possess, both as a source of pleasure to yourself and others, and, also, as an artist; I dare not add more or I should be tempted to fill a greater share of space than I have the right to claim.

Texture.—The truthful representation of the characteristics of different surfaces, the securing of which is one of photography's most striking beauties.

Tone.—A picture may possess great clearness of tone, or brilliancy of tone, or deficiency of tone, not only in reference to tones of colour, as warm, cold, &c., but also to those which pertain more especially to ærial perspective and chiaroscuro. Clearness of tone will result from the skilful juxtaposition and arrangement of tones, in securing gradation and breadth; brilliancy of tone will be the result of such judicious contrasts as may render the breadth more decided, and the chief passages more striking; and deficiency of tone will arise from the absence of sufficient contrast, want of gradation, or the destruction of atmospherical effect. Ruskin says,—"I understand two things by the word 'tone:'—first the exact relief and relations of objects against and to each other in substance and darkness, as they are nearer and more distant, and the perfect relation of the shades of all of them to the chief light of the picture, whether that be sky, water, or anything else. Secondly, the exact relation of the colours of the shadows to the colours of the lights, so that they may be at once felt to be merely different degrees of the same light; and the accurate relation among the illuminated parts themselves, with respect to the degree in which they are influenced by the colour of the light itself—whether warm or cold; so that the whole picture (or, where several tones are united, those parts of it which are under each) may be felt to be in one climate, under one light, and in one kind of atmosphere; this being chiefly dependent on that peculiar and inexplicable quality of each colour laid on, which makes the eye feel both what is the actual colour of the object represented, and that it is raised to its apparent pitch by illumination." In the same work, Ruskin, after pointing out how poorly white paper represents light, and how useless a mere black surface, reflecting a great deal of light, is to depict the "void spaces" of nature's deepest shadows, says.—"Here we are, then, with white paper for our brightest light, and visible illuminated surface for our deepest shadow, set to run the gauntlet against nature, with the sun for her light, and vacuity for her gloom." And he afterwards adds,—"It cannot but be evident at a glance, that if to any one of the steps from one distance to another we give the same quality of difference in pitch of shade that nature does, we must pay for this expenditure of our means, by totally missing half-a-dozen distances, not a whit less important or marked, and so sacrifice a multitude of truths to admit one."*

For this reason I have already pointed out how little of the two extremes of white or black we should aim at securing in our photographs. The soft and tender gradations of nature can only be imitated by watching, and expending with the reluctant and jealous care of a miser, our little stock of tones. The lavish waste of power displayed in the presence of too much black or too much white must result in that absence of tone and æreal truth which, being commonly seen, have created so much misconception in reference to photography as an imitative art. While the prodigal expenditure of white or black must prove destructive of tone, atmosphere, and breadth, a very little, judiciously obtained in your negative or positive, will throw the whole picture into luminous truth and natural relief, conveying the real beauty and sentiment of the scene to the mind of every spectator, although it is very possible that sundry sage critics we wot of would cry out against such a photograph as terribly wanting in the abrupt transition from extremes which, by some mysterious process of reasoning, they feel convinced give "*vigour, brilliancy*, and *roundness*," and in that hard cutting up into sections and patches which they misname "sharpness." (My good friend of the British will say, Here's "another half-brick from a Wall.") Your large black space is a piece cut out of the picture, an ugly, unsightly blot over the subtle gradations which make shadows look like shadows. Your patch of white swallows up in its unmeaning blank, the brilliant high lights, and all their soft and beautiful attendant tones; and thus, with the smallest means for the greatest ends, you lavish away the very paltry little stock of tones you possess with as much careless extravagance as if you could draw up and use darkness from the earth's deepest caverns, and bid the very sun himself shine out from your pictured landscape.

Nor must we overlook the importance of tone as associated with *expression*. (See *Chiaroscuro*, *Harmony*, and *Expression*.)

My purpose in writing the articles now concluded was duly expressed in their opening paragraphs; but during their progress, I have become more than ever convinced of the necessity for the information I have, through their agency, endeavoured to supply. These terms in the mouths of those who are profoundly ignorant of their actual importance and significance, could only be a mere meaningless jargon; but when certain critics in some of our Photographic Societies and journals took to advancing them in their arguments and criticisms with such meanings attached as were in *direct contradiction* to those which actually pertained to them, it was high time that somebody should endeavour to propagate enough knowledge to modify or prevent the mischievous tendency of so foolish a course; and, no one better fitted for the task being ready, or willing, to undertake it, I have done what I could.

Although arranged in dictionary form, I have, during my now completed task, only confined myself to simple definitions of meanings, when these sufficiently explained the technical phrase in question, and wherever information of a practically useful nature could be introduced, I have not hesitated to lengthen my explanations into the more important form of a short article.

Having an eye to what had been previously published in these columns, and thinking it would be unfair to regular subscribers were I to repeat in detail information already so ably given in the valuable papers contributed by Lake Price, some subjects have not been treated with the fulness their importance might otherwise demand.

To raise and improve the quality of photographs as artistic productions, and so raise to its just position our infant fine-art photography was and is, however, the chief end I had and have in view.

* See "Modern Painters," a work every photographer should be acquainted with.

TRANSPARENT POSITIVES.

By Professor Martin, of the College of Sainte-Barbe.

If the exposure in the camera has been too long for a positive, the operator must stop the development with pyrogallic acid at the moment when it may be feared that the shadows will become too thick and obscure the detail. In this case the reduced silver exhibits the peculiar red colour well known to experienced photographers who develop with pyrogallic acid. The action of chloride of gold does not cause this red colour to disappear entirely, and if it is not injurious to the positives employed in certain optical experiments, it is at least unsuitable for those intended to be transferred to paper.

Excessive exposure is not the only cause of the production of this red hue; the presence of an excess of acetic acid in the pyrogallic solution, or in the nitrate of silver, the employment of a collodion slightly alkaline, the taking of a picture a little too transparent or too harsh will also produce it.

It is not always easy to remedy these inconveniences. With respect to the exposure, it may be remarked that if it be insufficient, the picture will be incomplete in the lights, and will only give extreme lights and darks without half-tones. If the quantity of acetic acid be diminished, it is to be feared that the whites will not be sufficiently preserved.

In other circumstances, and by the employment of old collodion too rich in iodine and in ether, with baths containing too much free nitric acid, the reduced silver will take a grey tint; the image, imperfect in the shadows, is fogged, and even after the action of the chloride of gold, retains a blueish grey hue, both cold and disagreeable. In fine, the results are sometimes very excellent, but always very uncertain.

The object of the following method is to render the production of this kind of pictures more easy and certain.

The collodion I employ is a little richer in cotton and in iodide than the collodion described in my last communication (page 314) the nitrate of silver bath is the same.

The plate, sensitized in the usual manner, is exposed in the camera, a little less time than when the pyrogallic acid developer is employed, and the image is developed with sulphate of iron.

The silver reduced by these means is white, and gives only grey shadows. But this white silver must be transformed into black silver; which takes place when we pour upon the image, after being developed and well washed, *but not fixed*, a saturated, but non-acid solution of bi-chloride of mercury: the reduced silver becomes black by precipitation of metallic mercury. The picture is then carefully washed, and a solution of cyanide of silver in cyanide of potassium is poured over the plate.

This solution is obtained by dissolving 10 parts of cyanide of potassium in 100 parts of water, and pouring into the resulting liquid a solution of nitrate of silver of the strength of 10 per cent. until the precipitate of cyanide of silver, which is formed, ceases to be re-dissolved upon agitation; upon being filtered, the solution is ready for use.

We can replace the salt of silver by a salt of copper, which gives the same results; the metallic copper thus precipitated is black, and gives to the picture a tone exactly like that given by silver.

Hyposulphite of soda may also be substituted for cyanide of potassium, and the solution be prepared in the same manner, either with silver or with copper. Hyposulphite of soda, which has served for fixing negatives developed with pyrogallic acid, and whose action has become exhausted, gave very good results upon the addition of a salt of silver or of copper.

All these liquids will serve a great many times, those of silver especially, before their action will be exhausted.

When we pour one of these solutions upon the plate after the action of the mercury, we perceive the blacks to acquire great intensity; it is only necessary to wash the plate well, and fix with fresh hyposulphite of soda. Cyanide of potassium is not suitable in this case, however weak its solution may be; it whitens the reduced silver.

If it is intended that the picture be retained on the glass to be viewed by transparency, it is only necessary to leave it to dry, and varnish it if it be not sufficiently transparent.

When the picture is to be transferred, it must be very carefully washed after being fixed with hyposulphite, and immersed for a few minutes in water acidulated with sulphuric acid. The latter operation is necessary, as the collodion will have acquired an excessive adherence to the glass plate.

The same operations are applicable to cliches developed with sulphate of iron, and in which the blacks are sometimes found rather too grey.

PHOTOGRAPHY AT LITTLE PEDLINGTON.

Sir,—A famous work called "Little Pedlington, or the Sayings and Doings of the Pedlingtonians," once held up to the eyes of the world certain personages and events in order that from such representations others might take lessons, and improve.

Now we have photographers in Little Pedlington, and I do think their sayings and doings are as worthy of notice as those above referred to; nor do I think it improbable that by the means of a few letters I might do some little good to the London representatives of the art and science.

Doubtless you well know little Pedlington; for to whom is little Pedlington a stranger? Who is not familiar with that imposing town? Who, at least in imagination, has not entered its High Street, from the London road, and rambling on through its East Street, West Street, South Street, and North Street, and finding themselves in that fashionable promenade—the Market Square—have not gazed in wonder on its stately growth: have not admired that noble crescent with its twenty-four bow windows and its twenty-four green doors, ornamented with their twenty-four bright brass knockers? Who, we repeat, has not visited Little Pedlington?

Ah! how well do we remember when, from the picturesque heights of Snapshank Hill, whence one can, to use the words of its world-famed poet—

"Fondly gaze upon the scene sublime."*

we first marked—to return again to the mighty Jubb—

"Fields beyond fields, as far as eye can spy!
Above—that splendid canopy, the sky!
Around—fair nature in her green attire;
There—Pedlingtonia and its antique spire!"

How well can we recall the principal boarding-house in the Crescent, Yawkins's Library, in Market Square, and Snargate's in High Street. The Brewers' ex-out-house, now the theatre, and the fashionable skittle-ground, decorated with the brush of that mighty genius Our Daubson, whose one shilling profiles once won for him so vast a fame, and so glorious a name, wherever refinement and intellectual culture spread the love of art; and whose shilling photographs are now so anxiously sought by all who have a proper taste, and can appreciate the wondrous perfection of the scientific and artistic intellect in his magnificent productions!*

Think you, then, that while your new art and science has been originating journals and societies, and chemical discoveries, and optical inventions, &c., in London, Pedlington has been idly standing in the dark? No! ten thousand times no! and after that another and a louder no! again.

Is not the Rev. Jonathan Jubb, the bard of Pedlingtonia, president of the Pedlington Photographic Society? and is not Samuel Sirocle, member of no end of learned societies, president of the Pedlington Photographic Club? Does not Frank Staindigits, Esq. edit the *Photographic Purveyor*, and is not Yawkins editor of *The Pedlingtonian Photographers' only Journal?* Because your heads have been buried in the sand of your egotism, are ye to flourish your tails in triumph as the only birds in creation? No! for I, the Secretary of the Pedlington Photographic Society, will clutch the pen which shall point out how vital and how active is Little Pedlington's photography. Will show you how many of your boasted discoveries are due to Little Pedlingtonians; and how stale to the photographers of Pedlington are those improvements to which your journals and societies are devoted.

In my next letter I will call attention to the past doings of the Pedlingtonian photographers, after which I will, from time to time, send you brief reports of our societies' meetings, and those of the club, with occasional extracts from the pages of our journals.—I am, sir, yours most respectfully,

Tripod Cameron.

Hon. Sec. to the "Pedlington Photographic Society," and regular Contributor to the Photographical Purveyor.

West Street Lane, Little Pedlington, June 15th, 1861.

ON PHOTOGRAPHIC PRINTING.

BY COLEMAN SELLERS.†

In my last communication the subject treated upon was, the printing and toning of ammonio-nitrate paper. I now propose to say a few words about albumen prints. In regard to the paper employed, there is no doubt but that success or failure in the after processes depends very much upon the quality of the paper and its albuminous coating. But, as very few of us care about undertaking the preparation of it ourselves, we must so endeavour to simplify and render certain the various processes as to make up, in a measure, for the faults of the paper. All papers are not salted alike; hence, some require a stronger silver bath than others. As a general thing, however, a silver bath of 80 grains to the ounce is strong enough; and, if this fails with certain papers, I would rather not use them than increase the strength of the bath. In using the bath the silver hydrometer is an excellent instrument to approximate to the strength of the solution; but, as the bath gets old, due allowance should be made for the great quantity of nitrate of ammonium or nitrate of sodium in the solution. Hence it will not be amiss to read 85 for 80 grains in an old bath.

* "Pedlingtonia:" a descriptive poem by the Rev. J. Jubb.

* It is with painful feelings that we are obliged to state, that the national collection of paintings is still without that wondrous masterpiece of art, Daubson's Grenadier—which still—although with somewhat diminished brilliancy, may be seen at the further extremity of Yawkins's skittle-ground. Admission to see the painting may be had gratis, save on one day of the week, when the charge for admission is twopence.

† Condensed from *Humphrey's Journal.*

Much has been said about clearing a discoloured bath with kaolin, chloride of silver, and other articles. Some time since a most excellent article was published in this journal, recommending that citric acid should be added to the bath to clear it, by the formation of citrate of silver; this was siezed upon with avidity by many of my acquaintances, and with some—myself among the number—with success; but with others it was of no use at all. This led me to investigate the subject, and to arrive at the following conclusion :—Citric acid will form no precipitate in a solution of nitrate of silver; citrate of silver cannot be formed by the admixture of citric acid with a pure solution of nitrate of silver in water. But it is readily formed by the addition of any soluble citrate.

Hence, if to a saturated solution of citric acid we add a very little aqua ammonia, we will have an acid citrate of ammonium. A very few drops of this will cause a flocculent deposit, and will at once clear the bath of all colouring matter. This, however, must be used with great caution; for, by referring to any work on chemistry, it will be seen that citric acid has the peculiar property of assimilating with each of its atoms the three atoms of silver, while other acids only take up atom for atom. This can be readily tried by making, for instance, a solution of citrate of ammonium as above; also a similar solution of acetate of ammonium, adding each separately to portions of silver solution; the quantity of the deposit from the former will be surprisingly greater than from the latter.

Now, the reason why some succeeded and others failed in the use of citric acid is :—some of the baths were alkaline, while others were acid. Take any bath, neutralise it with soda or ammonia, so that it shall be slightly alkaline, drop into it a few drops of citric acid, and in an instant the whole mass will seem to curdle, and, as the deposit settles, the bath will be clear I like the action of the citric acid on the bath, and have made it a point always to keep my silver bath acid, while the toning solution is as nearly neutral as is possible. Hence I would recommend that, in mixing a fresh bath for albumen paper, it should be rendered acid with citric acid. In this condition it should be used until it begins to discolour, which it will do in time; then do not clear it with kaolin, but add to it a few drops of acid citrate of ammonia as above described: this will make a deposit of citrate of silver. Allow the bath to settle; pour off the clear liquid through a filter, but keep, as far as possible, the deposit of citrate of silver in the stock bottle, to which return the bath when not in use; filter any day before using, and the bath will never get discoloured again.

In silvering the albumenized paper I much prefer floating to immersion, and great economy can be practised in the way the paper is taken from the bath. If it be raised quickly it will be found that a large quantity of the solution is carried up with the paper, which runs off and is lost while drying. But if the sheet be raised quite slowly, the attraction of cohesion will arrest the gravitation of the fluid, and the sheet will be comparatively dry, so that little or no silver will drain off.

The toning solutions are the same as those recommended for the ammonio-nitrate prints, viz.: 30 grains of gold to 30 ounces of water, and a saturated solution of bicarbonate of soda; but the fixing solution should be stronger, *i.e.*, 10 ounces of hyposulphate of soda to 32 ounces of water; and the fixing bath for albumen prints should never be used for any other purpose. It contracts a very sickening odour from use, which I imagine might be prevented by the addition of a few drops of ammonia, though I have not tried it. Aqua ammonia has great keeping qualities, as is evinced in the albumen solution for Fothergill plates. Hence I have always added a little of it to the dextrine or gum I use for mounting, and to a solution of gum arabic which I keep for flowing over the finished negatives before drying.

But this is a digression, and we will return to the subject. I find albumen prints more difficult to wash previous to toning than the ammonio-nitrate prints, or it may be that they require more thorough washing. Too much care cannot be taken in removing all the free nitrate of silver from the surface, leaving only the chloride of silver and the albuminate of silver. The deposit of gold in the toning bath seems only to take place on the blackened chloride, and not on the white or high lights: hence, it is obviously wrong to use salt to destroy the free nitrate, because, by that means, we are coating the whole surface of the picture with white chloride and keeping off the gold from the blackened portions. I always wash for at least half an hour in running water, and then test some of the water with salt to see that the nitrate of silver is all gone.

The toning solution should be mixed in a very large flat dish in the following proportions :—32 ounces of water, 1 ounce of gold solution to each whole sheet of paper to be toned, that is, to every 17 stereoscopic pictures. The solution must be rendered exactly neutral by the addition of carbonate of soda in the manner and proportions as for the ammonio-nitrate prints. The prints will take much longer to tone than plain prints, and the toning must be pushed much further; they must be toned much deeper than they are required to be, to make up for the reddening effect of the hypo.

The dish, as I have said before, should be large—at least 14 by 18—so that the prints may be well exposed to the liquid, and they should not be continually moved about during toning, but at intervals during the process, as they tone much faster when at rest than when in motion. A good indication of their tone is, when they cease to look red by transmitted light. As they come to tone, throw into water, then fix in the hypo solution. When ammonio-nitrate and albumen prints are made on the same day, always tone the albumen priuts first; and, while they are toning and fixing, wash the plain prints, and then proceed to tone them in the exhausted toning solution for the albumen prints, and it is better, in most cases, to add, at least, 16 ounces of water to weaken it, the plain prints requiring so much less gold. Always fix the plain prints in a fixing solution prepared for them, and not in that used for the albumen prints.

By rigid adherence to the above directions I am sure good work can always be produced. Hoping that it may be of use to some of my readers, I leave the subject of photographic printing. In my next I propose to give an account of some experiments in collodion making, sensitizing, and using, which may prove useful to those who wish to make their own collodion.

CARTE DE VISITE PORTRAITS.

The *Saturday Review*, in a recent article on this subject, accords to first-class photographic portraits as high a position as the most enthusiastic photographers claim for it. As all outside recognition of the art claims of photography, are important and interesting at the present moment, we present our readers with the following telling extracts :—

"The last fashion of *cartes de visite*, as they are still called, combines many attractions for popularity. If the curious purpose which originated their trivial name was ever seriously intended, it never took effect. Happily, people pay morning calls with a less expensive visiting-card than that which the photographer furnishes. And though, as we have been assured, on one occasion a letter simply inscribed with an anonymous photographic portrait and the address of the post-town reached its destination through the post-office, yet a less public and practical use of our bodily presentiment is alone likely to survive. No drawing-room table of the day can be considered furnished without its 'photographic album;' and among the pretty toys of the season few can proffer so many substantial merits. Our domestic and political associations, our tastes and prejudices, our party or our piety, find ample scope within the catholic range of the favourite morocco volume which suits a necessity and a characteristic of human nature. It is at once a mild form of hero-worship and an illustrated book of genealogy. It does duty for a living hagiology, and it will supersede the first leaf of the Family Bible. If we happen to be as liberal or as lax in our symphathies as was Alexander Severus, our *lararium* may contain, besides the effigies of our own Royal Family—which in the real British album do duty as grace before meat—Cardinal Wiseman and Dr. Cumming on opposite pages, Cavour *vis-à-vis* with the Thalestris of Naples, and a popular preacher in dangerous proximity to a Pet of the Ballet. There is one practical use of a selection of *cartes de visite* which ought to be attended to—it helps visitors wonderfully as a key to the tastes or prejudices of the house. Especially in the embarrassing half-hour before dinner it is as well to be possessed of the party adopted by the Amphitryon. Here a photograph of the Bishop of Oxford—or perhaps of Cobden and Bright—may act as beacons to the incautious sailor in the narrow seas of small talk; while, in the way of suggestion and hints for that same dreary time of blankness of mind alike and stomach, there is nothing better than to fall back upon the pictorial Grove of Blarney on the table, which is sure to offer some opportunity of showing one's knowledge or one's ignorance of things in general or of men of the time. If there is not a Buckstone there may be a Bellew in the long series of contemporaneous biography; and when the ballet and the pulpit, the senate and the prize-ring, *haut-monde* and the *demi-monde* are alike laid under contribution for portraits—when we are admitted with equal familiarity into the Premier's cabinet and the *prima donna's* dressing-room—even the dullest mind in the dullest half-hour of the day may find something to talk about. Not but that a series of the *cartes de visite* has higher recommendations. It is something that a gallery of contemporaneous portraits of unimpeachable fidelity may be purchased for as many shillings as guineas used to be expended on Houbraken's heads or on Lodge; and it is a higher feeling than any prompted by the caprice of fashion, or by a vulgar curiosity which interests us all in the living form and features of men of renown."

Referring especially to the first of a gallery of photographic celebrities just issuing by Mayall, the article proceeds:—

"A series of living statesmen has been commenced, and the private chapel of political hero-worshippers has the chance of exhibiting an iconostasis of living worthies, collected on principles of an advanced eclecticism. Lord Derby leads the van, and the admirable photograph of the great Conservative leader, just published, is as remarkable a work of art as the process has ever produced. Somehow or other, apart from the mere mechanical perfection with which the accessories and texture of modern dress are rendered in this charming picture, there is an ideality in the portrait which has hitherto been scarcely attained."

We should like to call the especial attention of those who deny to photography the position of a fine art, to the following remarks:—

"It is the highest praise of photography if it can ever compete wish a first-rate portrait, and Grant's fine full-length of Lord Derby does not more satisfactorily bring out the mind and character of its subject than does Mayall's superb photograph. There is life and vigour in every lineament; and if we could have had this sort of likeness of the Cecils and Walpoles, the Pitts and Burkes of old time, we should have known perhaps something more of English history. If, as is unquestionable, one half of our conception of Charles I. is gained from Vandyke, posterity, if photographs are destined to reach posterity, will know more about Lord Derby and Lord Lyndhurst from the manipulating skill of Mr. Mayall."

GROUPING AND ARTISTIC EXPRESSION.—THE GROUPING OF TWO OR MORE PERSONS.*

BY L. M. DORNBACH, S.B.

HERE the same general rules which were given for the position of a single person must be observed, but to those several more will be added, having special application to the particular case under consideration. One of the principal things to be followed is, to aim at giving life and natural ease to the picture as well as the correct arrangement of the individual parts.

The photographer must always bear in mind that both objects and their corresponding images, when in focus with a portrait combination, are the segments of spheres, and hence all the members of a group must be at the same distance from the instrument, that is, not quite in a right line, but in the arc of a circle whose centre is in the axis of the lens.

If only two persons are to be grouped, the same observations that were made with regards to one are nearly all that need be observed, only it is well to pay particular attention to the direction of the eyes. The direction of the eyes should never cross each other between the persons and the instrument; the best way is to allow both persons to look at the same object on or near the instrument, or at two objects at about the same distance from each other as the persons, thus making the direction of the eyes nearly parallel; above all things, we must guard against the two persons casting their eyes apart; but this is only a particular case of the rule that the direction of the eyes should not intersect in front of the instrument, which would be the case in this instance, as they would cross each other behind the persons.

Two persons may be taken in profile, both being turned towards each other in a corresponding degree, or one may be taken in profile, and the other front view, the direction of sight being turned from the first. A union of arms or hands in any way never improves the effect; the independent and separate but well arranged position of each individual, without any dramatic effort, will in the end be found most desirable and agreeable. Of course these remarks do not obtain in the case of man and wife, or mother and child, where it is but natural to expect expressions of affection or dependence; it likewise does not apply to those cases of art which express the character of fear, anxiety, and care.

What is applicable in the grouping of two persons is equally so for more, to which must be added some conditions to be followed with every individual added to the group.

The best plan to proceed with five or more persons is, to arrange them into smaller groups, according to some definite conditions; that is, to combine them into groups of two and two, while one, the odd person in an odd number, is made the principal person in the tableau, and is somewhat isolated, or placed independent of the others, while the smaller groups of two are so situated with respect to this one as to present the most agreeable and striking effect. This is applicable for families and historic groups, only in the first both parents should be kept together in the same auxiliary group.

A special or particular rule to be followed in such grouping is almost impossible, since nearly every case presents something peculiar and different from every other, in other words, analogous cases are the exceptions; all that can be done in the premises, then, is to give general directions with reference to complex grouping.

Above all things giving the image a disproportionate breadth must be avoided, whence it is necessary to seat some of the members of the group, and to place some standing behind these first.

In this connection the size of the persons must be taken into consideration, since very tall persons, for example, placed behind short individuals sitting, will appear at great disadvantage, and produce a disagreeable effect, whereas it becomes such to be seated in front. Children and small persons are placed in the first row between those seated, and very small children find their proper place upon the knees of their parents.

The position of the head is subject to the rules already given for the arrangement of a single person, the same with regard to the arms and hands, these last, to give the best possible total effect, must be placed in the background and concealed as much as possible. Both hands of all persons in a complex group should never be visible.

As a general rule, the direction of sight of all is centred

* Continued from p. 252.

upon one object; but what is nothing less than natural and, consequently, beautiful, is to allow each person in the group to direct his sight in the direction of his particular position, whatever that may be, without distortion; the only thing to be guarded against is, that no one elevates the direction of sight too high.

It must be remembered that the observations made in this article, with regard to grouping for family or social portraits, fail, and are not applicable, whenever an artistic, dramatic, musical, or other society, is to be photographed. In such a group the principal arrangement of the different characters, and their acts and calling, have but a distant analogy to that which harmonizes with mankind generally. All that can be given in the form of a rule, to serve as a guide for the photographer, is to place all the individuals at the proper distance, so as to obtain the sharpest possible image, which not only smoothes the difficulties before him, but, in fact, furnishes the most desirable, life-like, and faithful photographs.

Simple as it seems to photograph groups at rest, all pedantry must nevertheless be avoided. Nothing seems more ludicrous than to see all the members of a group present the same stereotyped look and attitude, and a group photograph is valueless when every individual portrait has the same posture, giving a stiff appearance to the whole.

Only individual talent, personal industry, artistic perception, and practical attention to details can hope to master obstacles, remove all imperfections, and produce the most pleasing results.

Correspondence.

A TEMPTATION TO PHOTOGRAPHIC TOURISTS.

Sir,—Having long waited, but in vain, to see mentioned under the head of "Photographic Tourist," in your valuable journal, by some able writer, a description of the beautiful, romantic, and picturesque scenery of Lynton, Lynmouth, and its vicinity, I now make my feeble attempt to give a few outlines of it, hoping it may be an inducement to some more able person.

It is my impression that this romantic locality is not sufficiently known, valued and visited by my brethren of the camera. Not that it is altogether unknown to fame for every year brings crowds of people from all parts of the world, and it is visited by many of the most eminent artists of the day.

And every one who has beheld its beauties, inhaled its breezes, or bathed in its waters, is eloquent in its praise. I would earnestly call the attention of the photographic tourist who wish to recruit their health, and fill their plate-boxes, with rare and choice negatives to this locality. The sweet magic of streamlet and hill is here on every side, the mountain torrent, with its rocky bed and waterfall, the lakes studded with islets richly wooded, and surrounded with mountains, the sweet inland river bits and savage rocky seashore—all are here. Its glens! what more glorious? Its roaring rivers, foaming over huge rocks! Its thundering waterfalls! Its shady mossy woods and graceful ferns.

They equal in the picturesque beauty of their rocky streams and waterfalls any of the scenes which foreign transparencies have almost led us to believe belongs only to Switzerland; and make us regret that so much of our photographic talent should be expended abroad, when such lovely spots remain unphotographed—almost unknown in these islands.

The far-famed Valley of Rocks is about a mile west from Lynton, and is generally the scene first thought of. There are two roads to the valley—the one a carriage road, the other a path round the cliff called the North Walk. The latter is considered the best by which to gain the most impressive entrance to this stony combe. It is one of the finest terrace walks imaginable, which, for beauty and grandeur of scenery, may challenge England,—or, I may say, the world. Lynmouth and the sea lie 450 feet below; into it a stone may be thrown, so precipitous is the hill; to the right are Countisbury Hill and Foreland, the valley of the East Lyn, and Lyncliff, with the summer-house on its summit. With a suitable lens and camera, a magnificent view of it can be taken. To the left is the open sea at the mouth of the Bristol Channel; and Wales 21 miles across, the water lies in front. On a clear day the Welsh coast, with the counties of Pembroke, Carmarthen, Glamorgan, and Brecon is distinctly seen.

Proceeding onwards, the first terrace of rocks we come to is called the Devil's Chimney Rock, and Moddle-gate Rock; of the latter a pretty view may be taken for the stereoscope.

As you move on under masses of rocks, in all kinds of fantastic shapes, hanging threateningly some 500 feet or more above you, and terrific precipices below you 450 feet into the sea. Where you behold no gentle wavelets ripple over the sand, but sturdy Atlantic billows rolling in from the far north, come bounding over the stony strand, and leaping high into the air, as they strike against the projecting masses of rocks, mingle their thunder discordantly with the shrill screams of the sea-gulls hovering in thousands around.

> "So wonderous wild, the whole might seem
> The scenery of a fairy dream."

We next come in sight of Castle Rock, which gives a beautiful artistic picture, with the surrounding hills.

But no description in words, no pictorial representations can give justice to the wild grandeur of the scenery; it must be visited to be duly appreciated, and if once seen can never be forgotten.

The very top of the centre rock, overhanging the sea, called the Castle Rock, from some supposed resemblance to a castle, may easily be ascended by going up the craggy steep before you. From this path a good picture can be taken of rugged-jack, with entrance of north walk. On various parts of the rock there are a great number of stone seats and tables, and these are a great resort for picnics in the summer season. You ascend the very summit by going up a stony staircase; the view it commands is very extensive. "Imagine a narrow vale between two ridges of hills, somewhat steep: the southern hill turfed; the vale which runs from east to west covered with hugh stones, now rising in picturesque crags and fragments of stones among the ferns that fill it; the northern ridge completely bare, excorated, of all turf and all soil, the very bones and skeleton of the earth; rock reclining upon rock, stone piled upon stone, a huge terrific mass. A palace of the pre-Adamite kings, a city of the Anakins must have appeared so shapeless, and yet so like the ruins of what has been shaped after the waters of the flood subsided."

After quietly surveying the scene around, the grim, desolate gorge on one side, the sea so far, very far below on the other, the awful giddy depth beneath you behold the foaming billows rushing in like wild horses, and all around rise giant cliffs perforated with deep mysterious caverns.

A pretty stereoscopic view may be taken of Duty Point, with the great promontory of High Vear in the distance, by taking the west wing of the Castle Rock in the foreground.

On the south side of the hill facing this rock is a perpendicular mass of rock standing out from the side of the valley like a ruined tower, the layers resembling a pile of huge double Gloucesters, which has from time immemorial been called the Devil's Cheesewring or Cheesepress. As a close object it gives a good picture. There is a tradition that a party of Danes, who had landed on the coast, were overtaken and slaughtered in this wild glen. The legend appears to be confirmed by the fact, that a number of bones have been discovered in cutting a path up the Castle Rock.

I will here mention the romantic yet imaginary "Legend of Lynton Castle," included in a small vol. of the "Legend of Devon," printed at Dawlisle in 1848. In this a castle is given to Lynton, inhabited by the family of Lynton, who are described as having been victims to the Evil One from the year 500 to the middle of the 12th century, when Reginald of Lynmouth began to build a church to his God, on the site of an old abbey at Lynmouth,* whereupon the spell of the Evil One was broken, "the castle fell, the cliff heaved as if in pain, and the terrible convulsion formed the Valley of Rocks."

"The devil was seen scudding before the wind—he had lost his hold on the Lynton house."

The road running eastward through the valley leads back to Lynton, where a general view can be taken of the valley.

Indeed from almost every point of view the Castle Rock and the surrounding rugged cliffs afford a picturesque view.

L.

ROMAN'S MODIFICATION OF TAUPENOT'S PROCESS.

Dear Sir,—I have been pursuing the experiments which I told you I was making with this process, and am now able to communicate reliable results.

The plates are quite as sensitive as ordinary wet collodion.

Thorough washing before albumenizing, and after sensitizing, insures freedom from stains, and does not impair sensitiveness.

The ordinary Taupenot plates, after keeping sensitive at least a fortnight, are as good and as sensitive as those newly prepared.

Those washed after sensitizing with acetate of soda solutions (of course before and after, with water), and finally with a one-grain solution of gallic acid, are a little slower, but will keep a long time.

I exposed one half of a stereoscopic plate, to-day, for 25 seconds, and the other half for 50, when I was giving Fothergill plates three minutes for the same object. The first half was a little underdone; the other quite as well as the Fothergill, and full of half-tone. This plate was sensitized yesterday, and was not washed with gallic acid.

A half-plate exposed just afterwards with a Jamin's lens (front part of portrait combination), 10-inch focus, for one minute and a half, was very nearly done enough. I should have given quite as long or longer exposure to a wet plate; for the object presents much contrast, and the light was very dull. This plate had been washed with gallic acid, and was a month old.

M. Roman has been my tutor, of course; but I depart from his directions,—first, in washing thoroughly, instead of adopting the dangerous plan of leaving a lot of free nitrate on the plate; secondly, in not re-dipping the exposed plate in the aceto-nitrate bath; thirdly, in pouring very hot water over the plate, and then developing (with hot developer) on a holder instead of in a dish, and in renewing the application of *hot* developer, if needed, instead of using it tepid as he then does.

I enclose a description of my manipulation in detail, which, though it is in the main a repetition of what has been often published, may be of interest to amateurs, who yet want an ordinary dry process on which they may most surely rely, and which may be made as rapid as the usual wet process.—Yours truly, J. Galloway Cowan.

[The details, which will prove very interesting to our readers, shall appear in our next.—Ed.]

WHAT THE "ART AND SCIENCE" HAS COME TO.

A Fact for the Commissioners of 1862.

Sir,—Knowing the interest you and your readers take in all matters relating to photography, I am induced to bring before you a few facts which have been recently brought under my notice.

The east end of London, and probably the other suburbs, have lately been honoured by the visits of a peripatetic photographer, who carries with him apparatus, chemicals, mounts, and, in fact, all the etceteras of a photographic establishment.

This gentleman makes house-to-house calls, informing folks that he will, if they please, "take"—to use his own expression—"One on yer for fourpence, or all on yer," viz., the whole family, "for sixpence."

The tempting idea of securing a memento of his family at the above-mentioned cost, proved too much for a weak friend of mine, who, after being "done" by this gentleman, gave me the following particulars of the operation.

After being asked in, his first enquiry was for a dark cupboard; this not being forthcoming, the kitchen was rendered dark by hanging some cloths before the window. A chair was now taken into the garden, and the camera, a quarter-plate, set up. This being done, our photographer produced from his pockets a small gutta-percha bath, a bottle of developing solution, another of collodion, one of fixing solution, and one of bath solution, this latter being a very small one.

All being now ready, a $2\frac{1}{2} \times 2$ glass was taken, rubbed on the operator's coat sleeve, coated with collodion, and placed in the bath, the operator holding it by one corner, but as the solution was not deep enough to cover the plate in one operation, our friend had to lift it out and reverse it. Of course this produced a sharp line across the plate, and the only one in the picture that *was* sharp. The excited plate was now placed in the slide, exposed, and brought back to be developed; but, it not being in mortals to command success, the only appearance was that of a round spot about as large as a shilling. This failure our operator ascribed to the fact that the sun "went in" (into the camera?) at the critical moment of exposure. A second plate coated, exposed, &c., proved a complete success, and my friend enquired if the picture could not be framed. "Yes; but it would be tuppence more." This was paid, and the picture (which I enclose for your inspection) being handed over to its fortunate owner, the photographer "packed up his traps" and departed, having spent rather more than two hours and earned sixpence.

Apologizing for having intruded so far on your space, I remain, &c., J. C. L.

* No abbey and no church having ever existed at that place.

MALT AND TANNIN.

Sir,—Whilst ringing the changes on various preservatives, like many another amateur in search of a photographic elixir vitæ, it occurred to me to try whether malt and tannin would unite, and, if so, whether the good qualities of each would be enhanced or neutralized by the union. I have never been *perfectly* satisfied with either process, much as I am indebted to both.

The advantages of tannin have been fully set forth of late. Amongst others claimed for it, is that of extreme clearness in the shadows, the advantage of which is somewhat doubtful, judging it by the old motto, new version, the proof of the negative is in the printing, which may in one sense be called a truism.

The quality of prints from malt negatives please me, better, on the whole, than those from tannin, but it possesses one drawback, viz., the slowness of development which is tedious beyond endurance.

To come to the practical part of my letter. I tried the experiment of mixing the two fluids, *i. e.*, a 10-grain solution of tannin, and an equal quantity of infusion of malt made with 4 ounces to the pint.

After clearing it through a filter, I applied it in the same manner as tannin.

The advantages anticipated certainly seem to be realised, the negatives have very much the appearance of the malt process, and the development is reasonably quick, in fact, almost as rapid as with tannin alone.

Prints from two negatives are sent for your opinion. Is it worth the attention of the Experimental Committee?—Yours truly, G. S. Penny.

Cheltenham, July 11, 1861.

[The two specimens enclosed by Mr. Penny are in every sense charming pictures; well-selected subjects, good negatives, and excellent prints. They unquestionably prove that the combination suggested is capable of yielding the very best results, and we will bring it under the attention of the Experimental Committee. But we are forcibly reminded of a favourite apothegm of ours, that it is on the man, not the process that good pictures depend. All Mr. Penny's pictures we have seen, are very charming, and every specimen is valued by us.—Ed.]

REMOVING STAINS OF SILVER FROM PHOTOGRAPHERS' LINEN, THE HANDS, &c.

Mix together—

Common alcohol	20 parts
Iodine	1 part
Nitric acid...	1 „
Hydrochloric acid...	1 „

These produce a reddish liquid, which when applied to stains caused *by any salts* of silver, immediately converts them into chloride and iodide of silver, soluble in hyposulphite of soda, and cyanide of potassium.

The effect is especially marked on stained linen; when a black patch is touched with the liquid, by means of a little brush, it instantly turns yellow, with a violet border if the linen has been starched; on washing with the hyposulphite or with the cyanide, the violet tint immediately vanishes, and the yellow spot by degrees. It is well to wash the stained place after the application of the iodized solution to remove the acids, which might produce independent stains by contact with the hyposulphite or the cyanide.

For the hands, the operation is the same, only instead of using a brush, the skin may be rubbed with a piece of rag or cotton.

In applying the solution to paper impressions, greater care is required to prevent the extension of the action to the image itself.

The stains or spots usually present themselves on the skies, or in the backgrounds of portraits; by means of this liquid we may not only completely remove the stains, but lighten the tint of the surrounding space as much as we please.

I have often had occasion to remove skies in this way, and to bleach them, and, in particular, to produce clouds in them, of much better tone than can be done with indian-ink, even by a skilful hand.

The manner in which I proceeded was as follows:—The impression, soaked in hyposulphite, was placed in a porcelain basin kept in an inclined position, the foreground or image upward, and the sky downward; then, taking a small hair pencil full of the liquid, I rubbed the spots very lightly; at first they took a deep blueish tint, which vanished when the same pencil was passed over it, after being dipped in the hyposulphite, which had run down to the lower part of the basin; the stain, which was now yellow, gradually vanished as the hyposulphite was repeatedly renewed in this way, and the paper became white. It is true that to remove these stains I was obliged to bleach the whole of the sky, if they were on the upper part; and to lower its tone if they were near the tops of buildings in the horizon, leaving a stronger tint above, which, however, formed an arch, and increased the effect of ærial perspective, badly rendered by the skies of uniform tint.

The judicious employment of this liquid may also be brought to bear upon the backgrounds of portraits in case of accidental stains, so as to preserve the impression by a skilful repairing.

I have tried to lighten parts which were too black by this means, passing the brush lightly over such portions; the effect is, indeed, produced, but it leaves an uncertainty in the definition incompatible with the front objects, and a hazy tone, due to the bleaching of the supercial fibres of the paper, which, however, might be very useful in bringing down distances too strongly marked—a condition still very frequently met with from the excessive diminution of light at the sides of the picture. A touch with a brush containing a very little of the liquid, immediately followed by washing in hyposulphite, produces wonderful effects in the distances on either side near the edges.

For cleansing the hands, a weak solution of cyanide of potassium will be preferable to the hyposulphite of soda, on account of the persistent odour of sulphur left by the latter; but then care must be taken to rinse the hands well, to avoid the evolution and absorption of prussic acid.—*M. Gaudin.*

Photographic Notes and Queries.

Gallic Acid on Dry Plates.

Sir,—The following particulars may possess some interest, as bearing upon the subject of applying gallic acid to Fothergill plates.

I happened to have by me three plates prepared by the above process, and being anxious to test the principle referred to, I applied a solution of *tannin* to two of them, leaving the third as a test of the value of the application.

The result was as follows:—

The plates washed with the tannin turned out to be good, and produced excellent negatives; the other plate scarcely developed at all, and was covered with a dirty, muddy appearance all over.

This, therefore, argues well for the application of tannin.

I shall be obliged if you will inform me of the chemical difference in the action of tannin and gallic acid, and whether a weak solution of either is more conducive to sensitiveness than a strong solution? whether, in your opinion, gallic is better for the purpose than tannic acid.—I am, sir, your obliged servant,

Tannin.

P.S.—The application of gallic acid to Fothergill plates is not a new discovery, as the same thing was proposed by R. W. Hall, Esq., F.L.S., F.G.S., more than a year ago, and was published by him in a pamphlet on the above process, as well as being referred to in a letter to the *Photographic Journal* about the same time.

London, July 4, 1861.

[The photographic effects of tannic acid and gallic acid might be anticipated to be very similar. There appears to be, however, a decided difference in their results. The former, as used in the tannin process by Major Russell, gives, dense, clean, brilliant negatives, but is very slow; whilst the application of gallic acid to Fothergill plates, not only gives brilliancy and cleanness, but serves, to some extent, as it does in the calotype process, as an accelerator. A three or four-grain solution, in our own experience, is better than a stronger one of either tannic or gallic acid.—Ed.]

Apparatus.

VIGNETTE GLASSES.

Sir,—The use of vignette glasses has been much neglected on account of the expense (although it is but trifling), and many botchy looking pictures have been produced by the introduction of other misapplied apparatus.

The method I have used for some time is this:—Take a piece of white paper, about the size of double crown, upon which gum an oval piece of dead black paper, the size and proportion required, and with a dense collodion produce a negative as follows:—Move the paper backwards and forwards from and towards the lens; copies of the different sizes required may be thus produced with excellent graduation, which will be very good vignette glasses, and when varnished may be placed upon the negative, and printed in the usual way.

Another Style, with White Centre and Black Margin.

Place, this time, an oval piece of white paper upon a sheet of black paper, and take a picture precisely as before. To print, first place this vignette glass upon the sensitive paper, and print the depth required, remove the vignette glass and upon the unchanged white centre place the negative, and having placed the vignette glass which protects the margin in its place, proceed to print. This gives a vignetted picture on a tinted ground, whilst all the whites in the portrait itself are kept pure and clean, that of the paper is much lower in tone, giving an effect of great brilliancy to the picture.

If the centre of this vignette glass is not sufficiently intense, paint over part of the centre with gamboge, and shade off the edge.

I have also a revolving background upon the same principle now in progress. Geo. Owen.

Solihull.

Talk in the Studio.

Imitations of Cameos.—Photographs of cameos printed upon fine negative paper, gummed upon the concave side of brooch glasses, are now being mounted as artificial cameos, and very pretty they look.

Photography and the Telegraph.—The use of the electric telegraph for private purposes amongst commercial houses is becoming general. The first application of it of which we have heard in aid of the ready transaction of photographic business has recently been made by the London Stereoscopic Company, who have just a had wire fixed between their house in Cheapside and their printing establishment at Camberwell, the exigencies of a large business in the production of *carte de visite* portraits, rendering such ready communication desirable.

Alkaline Gold Toning.—We are glad to observe that the alkaline gold toning process, which has hitherto not been practised much in the United States, is beginning to be recognized by our American brethren, as superior to the old hypo and gold bath. The Editor of the *American Journal of Photography*, says: "The independent gold toning process is rapidly taking the place of the sulphuring old hypo nuisance, and people now have a fair prospect of procuring photographs from a majority of the galleries, which will last a few years at least. The new toning process requires a little more judgment and practical tact than the old method, and this fortunately; photographers need difficulties, whereon to sharpen their wits. When the toning process is thoroughly understood, however, it is astonishingly simple and easy; it is preferable on every account.

A Hint to Farce Writers.—We were somewhat amused lately with an incident narrated by one of our principal London photographers. At a portrait establishment, in which a very large business is conducted, it is the custom to number each negative with the number of each receipt, and to place the same order under the same number in the day-book. Through the culpable carelessness of the gentleman to whom this business was confided, these numbers became a source of no small confusion, and, as will be seen, some mischief. Frequently some charming young girl, sending the number of her negative and desiring a positive copy, would receive in lieu thereof a portrait of some ancient lady of the most unattractive appearance; or some smart young buck would obtain a portrait of an old-fashioned, elderly gentleman, &c., &c. The incident, however, to which we would more particularly call attention, is the following:—An elderly lady, recently married to a younger gentleman, so modestly appreciated her own attractions, and so highly esteemed those of her partner, that she grew suspiciously jealous and watchful, eagerly seeking what she so terribly dreaded, as these poor victims of the green-eyed monster will. A friend—highly respected by both husband and wife, and who was on the point of leaving England—was persuaded by the former to accompany him to the portrait establishment aforesaid and sit for a picture. When bidding his friend's wife adieu, he said to her, mysteriously, "If you send to Messrs. So-and-so, of ———, the photographers, for a copy of negative No. 395 (or whatever the number was) and tell them it is the portrait of a friend who accompanied your husband on such-and-such a day, you will have what you have, I hear, often asked for!" The lady did so, and one morning, to her intense horror, received a photograph of a young, pretty, saucy-looking, and evidently fast girl in the most extravagant excess of fashionable attire, in short, "a pretty horsebreaker." We leave you to imagine the scene; the hysterics, the reproaches, and the tears on the one side—the amazement, the useless protestations and explanations on the other side. The photographer was appealed to to set matters right, alas! matters grew more wrong; the gentleman who kept the books being above the power of mistakes. The Divorce Court loomed grimly in the distance, the wife was broken-hearted, the husband frantic; what could be done? At length the friend, who had not reached the vessel before it sailed, returned to town, when all was made clear, and while the wife was the better for her lesson, the photographer saw how important to his interests was the proper keeping of his books.

To Correspondents.

Homo.—Equal parts of iodides of cadmium and sodium, say two grains of each, and half-a-grain of bromide of cadmium, will give you a collodion that ought to remain unchanged, or improved, for 12 months after iodizing, if everything else is in proper condition. We have collodion that has been iodized upwards of that time, and is as sensitive as the day it was mixed. In making proto-nitrate of iron, we prefer the nitrate of baryta. You do not state what iodides and bromides are in your alcohol, but in any case it would be scarcely worth the trouble of getting rid of them for the value of two or three ounces of alcohol.

Gulliver.—Transparencies are printed on glass, not on paper, and several articles on the subject have recently appeared in our columns. Paper prints, produced in the usual way, may sometimes be used as transparencies for some purposes, after they have been waxed; but they are not comparable to transparencies on glass.

G. R. M.—The white spot appears to be caused by the contact of some acid. We met with such a one the other day from a particle of citric acid coming in contact with a print during the washing. The dark spots appear to be caused by the contact of nitrate of silver with the print before the hypo is washed out of it. They would not show until after the picture was exposed to the light, when they turn the dirty brown now exhibited. Other causes might produce them, but these are the most likely.

An Old Subscriber.—You may try the addition of iodine to your old bath containing acetic acid. If it fog, however, as you describe, it probably contains organic matter, which you may endeavour to precipitate by sunning, and then add the iodine. Perchloride of iron is usually prepared by dissolving the peroxide in hydrochloric acid, or it may be produced by heating iron wire in excess of chlorine. You do not state for what purpose you require it, nor whether you are accustomed to chemical manipulations.

X. Y. Z.—The gallic acid solution should be about three grains to the ounce, and is poured on immediately after the last washing. The exposure of a Fothergill plate, with the lens and stop named, would, of course, vary with the kind of object to be taken, and the nature of the light. Perhaps an average of thirty seconds might be named, varying, in a very fine light, to as little as fifteen seconds, and increasing to a minute or upwards. We are not fond of changing bags or hoods for our own use. Squire and Co. have a convenient hood. There are also changing boxes, which are less troublesome. But least troublesome of all is a series of double backs, all filled with plates. We are glad you so highly approve of the lenses we recommended. Probably next week.

Charles Scarfe.—The primary evil is in your glasses, which are not chemically clean, and the dirt causes the metallic reduction of which you complain. Your bath is probably in a condition which favours this effect, and as it is an old one, most probably contains an excess of organic matter, which is very detrimental to the production of good positives. Add a little oxide of silver to it, and expose it to the sun. Then filter and add sufficient acid to make it work well.

E. M.—The best method of lighting a chased silver cup is to place it in a position where it will have a diffused light all around it, but a little stronger on the side where the inscription is. Give a long exposure, with a bromo-iodized collodion, and iron-development, you will thus get it out much more softly and harmoniously than by a short exposure, which would give the lighted parts very dense, and the shadowed parts very black. A transparency on glass much more adequately represents the colour and texture of silver than does a paper print. We were from home when your letter arrived, and this will reach you sooner than we should have time to write privately.

Acetic Acid writes as follows:—Sir,—The meetings of the Photographic Society are so much occupied by the quasi-scientific gentlemen, who are fond of delivering themselves conspicuously on all subjects, whether they understand them or not—artistic questions not excepted—it occurs to me that a stuffed gorilla, placed in some corner, might serve, *en pendule*, to cut short some of the bickerings, and thus save much of the time of the meeting, and spare us a considerable amount of twaddle. [The "stuffed gorilla" to which our correspondent refers, will be unnecessary, since a provincial contemporary has secured a specimen of the genuine animal, alive and foolish, as may be seen in a recent number.]

T. P. E.—We do not know of a dark box in existence such as you desire. We have described from time to time various dark boxes and tents, and shall continue to do so. Probably a combination of the points of those you will find already described in our columns, would meet your case. We prefer the boxes with sleeves to any arrangement which envelops the head.

A. Adams.—We have not met with any similar spots before; but we are not sure that they will grow any worse and ruin the picture as you suppose. Try filtering the toning and fixing solutions. We should in any case advise you to omit the acetic acid from the fixing bath, as it will assuredly slightly decompose the hypo, and cause sulphur toning in a greater or less degree, thus endangering the permanency of your prints.

Ashford.—Your prints give great promise, that containing the water has no faults of manipulation. The others are a little under-exposed. Go on practising in the same direction, but choose better subjects: these have very little pictorial value. Your lens ought to cover better and give more depth of focus; try the next size smaller stop.

Economy.—The manipulatory part of albumenizing paper is generally very troublesome to beginners. The minute bubbles would be more easily avoided if the albumen were more limpid. Keeping for a few days would make it so. To keep the paper from curling up breathe upon the back of that part which curls up. This will often make it lie flat at once. Several excellent formulæ for preparing albumenized paper have appeared in our pages. You will get good results by the formula you name, if you omit the ammonia. That is in our opinion entirely a mistake. Some very good authorities recommend the addition of acetic acid, and we believe professional albumenizers often use it. It will certainly make the albumen more limpid, and, we believe, add to the brilliancy of the print. The presence of the ammonia will materially retard toning.

An Amateur.—India-rubber gloves may be purchased which will keep the fingers clean; or india-rubber finger-stalls will, with care, answer the same purpose. We do not like such things ourselves, remembering the adage about the "cat in gloves." With moderate care there is no need to stain the fingers seriously. The best method of avoiding it, which we know, is to use a piece of mackintosh cloth, about a foot square, in the left hand, and hold the plate, whilst developing with it, between the finger and thumb, as a waiter would hold a hot plate with a napkin. By this method stains may be quite avoided, as it protects the whole hand.

H.—We have no intention of noticing such puerilities. Nothing would delight the proprietor of the Journal in question more than that we should so far dignify his paper as to think it worthy of resentment. We are forcibly reminded of the "fantastic tricks" of the "angry ape" to which our great dramatic bard refers. Our time, thought, and space, are engaged by more important matters.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 151.—*July* 26, 1861.

THE REV. J. LAWSON SISSON'S RAPID DRY PROCESS.

Some weeks ago we announced to our readers that the particulars of an extremely rapid dry process had been communicated to us by the Rev. J. Lawson Sisson, and that the only condition attached to the publication of all details was that we should first try it thoroughly ourselves. We have done so, with varying success as to results, but always with considerable rapidity as regards exposure. It has also been tried by several of our friends: the results we shall state in due course.

Before proceeding further we will give the details of the process, and for exactness we will first state them in Mr. Sisson's own words. The manipulations in this process are very similar to those recommended for the preparation of tannin plates. Mr. Sisson says:—

"I used Ponting's collodion, ordinary nitrate of silver bath, washed the plates in two or three baths of water, poured over carefully a small quantity of the liquid, and then raised up to dry in a warm room, just as in any other dry process."

The preservative solution is made as follows:—

"If you take one ounce of ordinary gum arabic and dissolve it in one ounce of water by gentle heat, and then by degrees add one ounce of water to it in which has been dissolved some common borax, biborate of soda, you will have a most remarkable mass, twice as large and twice as stiff as the first solution. This is, or ought to be a well-known fact. Now keep adding water in which has been dissolved as much borax as it will take up (it dissolves a very very small quantity) until the liquid is almost as thin as water; then add a small quantity of spirits of wine to the solution, which will no longer precipitate the gum as before, but absolutely rather thicken the solution, as careful experiment will show you."

The development Mr. Sisson states may be effected either with pyrogallic acid and silver, or iron and silver, the latter giving the most rapid results.

The general characteristics of the negatives obtained by Mr. Sisson were, as regard softness and delicacy, as nearly as possible similar to those obtained by wet collodion. The tone is very fine for transparencies, being of a rich warm brown black not requiring any toning. The plates have in Mr. Sisson's hands kept for months without deterioration, and the preservative solution was perfectly good at the end of twelve months. All the prints we have seen from Mr. Sisson's, vouch for the excellent character of the negatives.

In following out the above instructions for preparing the preservative for our own experiments, we made a solution which contained, when completed, six grains of picked gum arabic, from two to three grains of bi-borate of soda, and twenty minims of alcohol to each ounce of water.

We sensitized several stereo plates, in some of which a bromo-iodized collodion was used, and in others a simply iodized sodium collodion. On removal from the ordinary nitrate bath each plate was placed in a dish of distilled water, and remained there until another plate was prepared, when it was transferred to another dish of common water, and after remaining there until another plate was coated, was finally carefully washed with about a pint of common water poured from a jug. Sufficient of the preservative was now poured over the plate at one end. and suffered to flow off at the other; and then a second portion was poured on at that end. and after flowing over the plate, drained off at the opposite end. The plates were then reared up against the side of a large jug containing hot water and dried.

The plates were exposed within a few days, some in a moderate diffused light, others in weak sunshine for various periods from two seconds to ten; using a Dallmeyer's stereoscopic lens and three-eighths stop. Some were developed with a solution, containing fifteen grains of iron, and fifteen minims of acetic acid to an ounce of water, to which three or four drops of a twenty-grain silver solution were added; and others with a two-grain solution of pyrogallic acid. The results varied, the best negatives being those prepared with the simply iodized collodion, and developed with iron; a five seconds' exposure in a weak sunlight giving an excellent negative. Another plate, which received ten seconds' exposure in diffused light, developed with pyro gallic acid, yielded a similar picture. The negatives were clean, crisp, and vigorous, black in tone, and in all respects satisfactory.

So far the results were highly satisfactory and promising; but we are bound to add that in several other experiments we were not so entirely successful. Unless the utmost care was used in washing away all the free silver, a tendency to a red fogging was present, which we have noticed on other occasions in plates prepared with gum. In all cases, however, the results were superior in rapidity to most other dry processes, and very little inferior in sensitiveness to wet collodion. The development is almost as rapid as that of a wet plate, and we noticed no tendency to blisters, or danger of losing the film.

The reports of the gentlemen who have tried plates prepared with this preservative vary; but as in all the tendency to fog or stain in developing, unless great care had been used in preparing the plates to get rid of free nitrate, it is quite possible that the cause might be found in some peculiarity of the solution used, which was in all cases from the same bottle as that from which we ourselves found similar results. Some of our friends state that they found the plates not more rapid than those prepared by the Fothergill process, whilst others found less than half the exposure sufficient.

It was our intention to have submitted the process to further experiment before publication; but an unusual pressure of duties has prevented us, and as the season is rapidly advancing, we think it desirable that our experimental readers should have an opportunity of trying it before the summer is passed. In our hands it has justified our hopes of rapidity, and in the hands of the inventor, the Rev. J. Lawson Lisson, it appears to have yielded results of the utmost uniformity, both in rapidity and in the high quality of the pictures produced. To those of our readers, who may be anxious to try the process, we should recommend a little less gum and a little more borax in the solution, and the utmost possible care in washing before applying it. We shall be glad to learn the results in the hands of any of our readers.

MODES OF FIXING NEGATIVES.

Since the practice of using iron development for negatives has become general, especially amongst portraitists, whilst a higher class of pictures, softer, rounder, and more delicate has been produced, we have not unfrequently heard complaints of some little difficulty in obtaining sufficient brilliancy and vigour. As, under these circumstances, every minor addition to the printing value of a negative is of importance, we think it may be just worth while to call the attention to the difference in this respect caused by different modes of fixation. The superior solvent powers of cyanide of potassium, and the readiness with which it is removed from the film by a slight washing, have made it a great favourite with many photographers; but we question whether these advantages are not often purchased at too dear a price. Operators familiar with the positive collodion process, are well aware that the great advantage of cyanide of hyposulphite for fixing glass positives consists in the fact that the image, when fixed with the latter is generally more or less brown or tawny, whilst it is much whiter when cyanide is used. Now in negatives the very opposite conditions are desirable; the brown tint is just that required in negatives, because least permeable by actinic light. It is not an uncommon occurrence to find iron negatives really less repellant of light than the amount of deposit would lead an observer to expect. Where cyanide has been used for removing the unaltered iodide of silver, this is very common, the negative being left of a colour most favourable for the transmission of light. The experiment may easily be tried by fixing one negative with hypo, and another with cyanide; or, what will answer the purpose quite as well, fix a negative with hypo, and then pour over one-half of it a newly-made solution of cyanide of the strength generally used for fixation. It will be seen that the colour of the part submitted to the cyanide inclines to white, whilst that to which the hypo only has been applied is of a decidedly tawny hue.

Another fact should also be remembered, that the tendency of cyanide, especially in a fresh solution, is to attack the image, and destroy the half tone. This tendency is much more apparent with some collodions than others, but we believe it is in most cases more or less present, and however weak the solution may be, a negative unless quickly rinsed after fixing will be in some degree acted upon, the delicate shadows suffering first, and thus robbing the print of much beauty. In another column a letter will be found from Mr. J. C. Leake, to whose attention we had called the advantages of hypo fixing when troubled with some want of vigour in iron negatives. Both the negatives and prints referred to bear out our conclusions. The difference is not very great, but it is unmistakable; and, as an able photographer recently remarked to us, referring to another photographic process, "In aiming at perfection, a very slight improvement is worth a great deal of effort."

The practice amongst first-class photographers varies in this respect. The very best portraitist we know invariably fixes with hyposulphite of soda. Some other good men use cyanide. One to whom we recently mentioned the subject uses cyanide, but always uses it over and over, in a dipping bath, the contents of the one now in use having been refreshed, but never entirely renewed for two years! and are so weak that about a minute and a half are required to remove the iodide. We have noticed this fact, however, that amongst the best photographers we know, cyanide is rarely used except where some intensifying process is used which is applied after fixing, in which case the colour of the film is of little consequence, as it is to be altered by further intensifying.

It is important for those who may have been using cyanide and are disposed to try hyposulphite of soda, to remember that where the latter is used, very careful washing is necessary to remove it from the film, and that, where available, warm water effects this much more readily than cold.

PHOTOLITHOGRAPHS.

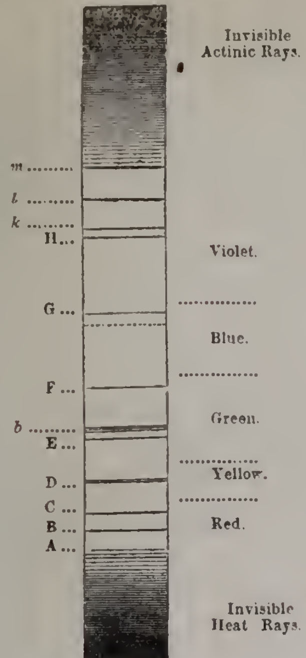
We have received from Mr. Ramage, of Edinburgh, a series of reproductions of engravings by means of photolithography, which exceed in delicacy and beauty all we have hitherto seen. The whole of the subjects are in line, and do not, therefore, in principle, surpass the productions of Col. James or Mr. Osborne, and, indeed, it is probable that the process by which these are produced is of a similar character to the processes of these gentlemen. The manipulation, treatment of the subject, and the results generally, are decidedly the best we have seen. As they are all from familiar engravings we are enabled to judge how far the subject has lost in translation by means of photography, and are bound to state that in many instances, whilst they have gained in delicacy by the reduction in size, they have not lost in any respect. The negatives are about whole-plate size, and comprise—"Uncle Toby and the Widow," after Leslie; "Tartar Banditti Dividing the Spoil," after Sir W. Allan; "The Combat," after Etty; "Cup Tossing;" "The Jew's Harp," after Wilkie; and "The Prisoner of Gisors," after Wehnert; the last-mentioned pleases us most, being a charming transcript of a very charming engraving. There is another specimen in which one of the full-page wood engravings from *Punch* is reduced to a size about three inches square, which strikingly illustrates the value of this process for producing reduced and exquisitely delicate copies of larger engravings. Another peculiarity of the specimens before us is a novelty in the paper on which they are printed, which is prepared with some pigment so as to give a most admirable surface, and materially aids in the delicacy of the results. Whilst many photographers are devoting any amount of effort so as to secure absolutely black tones in their prints, Mr. Ramage, with any colour he may choose at command, has the good taste to choose a black with a decided suspicion of warm purple in it, giving a peculiarly agreeable, warm, velvet-like bloom to the deep shadows.

Mr. Ramage remarks, in a letter which will be found in another column, that, notwithstanding many promising attempts, he has not succeeded yet in producing any subject with half tone sufficiently perfect for public inspection.

Scientific Gossip.

The invitation which we made in our last "Scientific Gossip," to examine by means of the spectroscope any samples of coloured glass with which our readers might desire to glaze the windows of their photographic laboratories, has been responded to by several photographers. Before, however, we give the results we have obtained with these pieces of glass, it may perhaps be as well to refresh the reader's memory on one or two points connected with the spectrum, and the action of coloured light on silver salts.

In our former article we explained the principle of the spectroscope, and stated that by its means a very pure solar spectrum could be obtained at any time, even when the sun was not shining, by pointing the instrument towards a white cloud. This solar spectrum is, as is well known, a luminous brilliantly coloured band crossed with an immense number of sharp black lines of all degrees of visibility. If our readers refer to the accompanying diagram, they will see a very accurate representation of the spectrum, with the principal lines with which it is crossed. At the lower end of all are shown the heat rays; above those, and commencing a little below the fixed line A, are the rays of red which extend upwards to between C and D when the yellow begins. The band of yellow is very narrow and rapidly merges into orange, which at about midway between D and E changes to green. This colour extends in great purity to a little beyond F, when it takes a bluish tinge, and rapidly gives place to blue, which extends upwards, merging into a purple tint at H, until nothing more of the spectrum is seen, unless direct sunlight be used, when the line H and a little space beyond is distinctly visible, and appears of an indeterminate lavender tinge. Beyond this visible point the spectrum still extends, consisting in these highly refrangible parts of the chemically acting photographic rays. Now, although these invisible rays are termed the chemical rays of light, they are not the only ones which act upon a sensitive surface. The photographer makes use of rays of light far down into the visible coloured space. Thus, when the sensitive surface consists of iodide of silver, it is affected by all the rays of the spectrum situated above the dotted line



just beneath the line G in the diagram; iodide of silver being sensitive to the upper half of the blue rays as well as to all above. When the sensitive surface contains bromine there is equally with iodine a definite boundary line of action, the darkening being produced only by the rays above the fixed line *b* (between E and F), forming three-quarters of the green, together with the blue, indigo, violet and invisible spaces.

It is necessary, therefore, that any piece of glass which is intended to obstruct all chemically acting light from the photographic laboratory should be absolutely opaque to all rays above the line *b*, whatever be the intensity of the light which is likely to fall upon it. Very few of the samples of glass which have as yet been forwarded to us fulfil this condition accurately; a few of them being so bad that our wonder is the owners did not long ago find out their worthlessness for themselves.

We will distinguish each piece of glass by a number for the sake of comparison, and in order that they may be identified, will give after the number the initials of the photographer sending them.

1, S.—This glass was described as being prepared with saffron, in the manner described in our number for the 21st of June last. (No. 146, p. 298.) The colour was very pale, and on placing it in front of the slit of the spectroscope it was seen merely to diminish the intensity of the rays above F, still allowing them to pass through. It would therefore afford scarcely more protection than colourless glass.

2, S.—This glass was prepared in the same manner as No. 1, a greater body of colour being on the surface. It was much better than No. 1, but still allowed blue and violet light to pass. A combination of the two glasses almost entirely cut off all the rays which act upon iodide of silver, and it is probable that two glasses as deeply coloured as No. 2 would prove quite efficacious where iodised collodion only was employed. It would, nevertheless, be very unsafe to trust to this glass when employing collodion containing bromine, as it transmits with facility rays in the green, which are capable of acting strongly on bromide of silver.

3, Sphynx.—This glass is of a light green colour, and is quite inapplicable to photographic purposes: it merely cuts off the extreme red below B, and the blue and violet above G, transmitting all the others with facility. Both bromide and iodide of silver would therefore be strongly affected behind it.

4, W.—A deep orange glass, which cuts off all the rays above the line E.

5, W.—A similar piece of glass to No. 4, only slightly differing in tint; it was found to possess the same action on the spectrum. In strong sunlight these two samples of glass seem to allow a faint glimmer of actinic rays to pass, but the amount would not be sufficient to be of any effect in an ordinary dark room, and it could be rendered absolutely safe by using two thicknesses.

6, W.—This glass looks of a dark brown when laid upon white paper, but if held up to the light, appears much lighter. Tested in the spectroscope it was found to exercise a marked action on the rays of light above the line F (the blue, violet and higher rays), but it did not quite cut them off, some being still transmitted. It would therefore be of no value if bromine were employed, and a very unsafe glass to use, except in a weak light, with iodised collodion.

7, W.—This is a similar glass to No. 6, but of a darker colour. It was found to have the same general characters when examined in the stereoscope, as No. 6; but owing to its deeper colour, less of the active rays were allowed to pass.

8, W.—A similar glass to the former two, but much darker. It almost entirely cuts off above the line E; but at the same time it much obscures the intensity of the lower luminous rays. In strong sunshine it was seen that the active rays were still able to struggle through in sufficient numbers to affect a sensitive plate.

The last three pieces of glass are coloured with the same substance, and merely differ from one another in the depth of intensity of the colouring matter. We do not advise this kind of glass to be used, as unless several thicknesses are used it is not safe, and if the colour be deep enough to obstruct all the active rays, so much light is cut off at the same time as to render it unpleasant to work by.

9, C. S.—This is a deep blood-red glass and exercises a very marked action on the spectrum. It cuts off, as with a knife all the rays above the fixed line D. None of the orange, green, blue, or higher rays can therefore get through in the least, and a room might be glazed with any number of square feet of this glass without being thereby rendered unfit for the most delicate photographic experiments. This is the most perfect glass we have yet examined, the only drawback being its dark red colour, which, after working behind it for some time, we have found to be rather painful to the eyes, causing everything for some time after to assume a greenish hue.

THE TAUPENOT (RAPID) PROCESS.

BY REV. J. GALLOWAY COWAN.

Coat with a suitable collodion, that is, one that adheres firmly to the plate after being treated as below described, and set up to dry for the last time. If the sensitized and washed coating shows a tendency to curl up at the edges when drying, doctor the collodion thus:—To one ounce of it add five grains of carbonate of soda, from which all moisture has been expelled, by drying it over a spirit-lamp, shake it well several times in the course of about an hour, and then filter it through blotting-paper, add an equal quantity of undoctored old collodion, and it will be fit for use. The collodion prepared by Mr. Ackland for dry processes, and Mr. Hughes's bromo-iodized, do not need this treatment.

Sensitize in an ordinary negative bath very slightly acid.

Immerse in a dish of distilled water, shake about till greasiness disappears, then wash with about a pint of common water, covering the surface with as much as it will hold, and moving it about as you would developing solution, for a few seconds, then pour down sink; repeat this till the water is all used, then drain and coat with a portion of—

Albumen	4 ounces
Distilled water	2 „
Iodide of ammonia	8 grains
Bromide of „	4 „
Chloride of „	6 „
Liquor ammonia	40 drops.

Let it rest on the plate for half a minute, then stand up to dry. When surface-dry, make quite hot before a fire or against a vessel of hot water.

These plates will keep for months.

When wanted for use, immerse in bath of—

Nitrate silver	35 grains
Glacial acetic acid	30 drops
Distilled water	1 ounce.

Let it remain about half a minute.

Remove and wash as before.

If wanted to keep some time, and to bear long exposure without injuring high lights, cover the surface with

Acetate of soda	5 grains
Water	1 ounce.

Wave backwards and forwards a few times, wash off with water, and finally coat with

Gallic acid...	1 grain
Water	1 ounce.

(Carefully filtered.)

and set up to dry spontaneously.

For rapid pictures expose same time as ordinary wet collodion.

To develop, pour over plate a good quantity of very hot water. Then pour on a portion of

Pyrogallic acid	3 grains
Glacial acetic acid	30 minims
Distilled water	1 ounce.

(Very hot.)

After the developer has thoroughly permeated the surface, say two minutes, pour it off, and pour on a fresh portion (for the sake of having it warm) to which about 6 drops of 10-grain nitrate of silver solution have been added.

When this developer discolours, wash the plate again with very hot water and proceed as before, unless the details are pretty well out, in which case cold water and developer may be substituted. The quantities of pyrogallic acid and silver must now be varied according to the state of the picture. If the detail is out, but lacking intensity, weaken the developer with an equal portion of water, and add more silver; if the picture is wanting in half-tone, use a little more pyrogallic acid, and only *one* drop of silver solution.

Fix in hypo-sulphite of soda, and wash very thoroughly.

For ordinary dry-plate sensitiveness, expose about six times as long as wet collodion, soak for a few minutes in cold distilled water.

Now pour on cold developer of the strength given above, adding no silver for at least two minutes, and then only one or two drops. Have the courage to keep back the silver till the picture won't come out without it, and you will avoid the deposit which is such an eyesore to the photographer, and which, though it may generally be rubbed off without injuring the negative, occasionally makes you the perpetrator of irreparable damage.

In my hands (and they are somewhat clumsy) plates treated in this way always yield negatives free from stains and blisters, and when they have been sufficiently exposed, full of half tone.

ON GOLD AS A PHOTOGRAPHIC AGENT.

BY MR. DAVIES.*

Pure gold is of the specific gravity of 19·5, and its atomic weight or combining equivalent is 197. It is almost invariably found in the metallic state, but occasionally contaminated with silver and copper: and in this state its only photographic use that I know of is that of being combined with the profits of some dealer in cameras, lenses, or photographic materials. I am sure most of you will be too familiar with its use in that direction to need any light that I could throw on the subject. Indeed, I believe it is more extensively used in that way than in any other, especially by amateurs.

Although in the metallic state, it is perfectly unoxidizable in atmospheric air, still there are various modes in which it can be made to succumb and unite to the other elements. Thus it can be made to unite with oxygen in two proportions. The suboxide $Au\ 2\ O_2$, and the sesqui or peroxide called auric acid $Au\ 2\ O_3$. Again, with ammonia, to form fulminating gold—the ammoniacal oxide—which is occasionally formed in making chloride by the hydrochlorate of ammonia method, which I advise you to avoid. Again, it unites with sulphur in two forms, corresponding with the oxides—disulphuret $Au\ 2\ S_2$, and the sesqui-sulphurite $Au\ 3\ S_2$; and with chlorine we have the sub or dichloride, which is quite different from our chloride, being a yellowish non-crystalline body, quite insoluble in water, and totally unfitted for photographic use; while, with the addition of one atom more of chlorine, we have the sesqui, per, or terchloride, or, as we call it shortly, chloride of gold, $Au\ Cl_3$, the additional atom of chlorine making it a crystalline body in dry air, and a moist mass in ordinary atmospheric air. Thus you have the key to the sealed tubes in which it is usually sold commercially. It has become, with this additional atom, soluble in water, alcohol, and ether; and such an affinity has it for ether, that you may extract every particle of it from an aqueous solution by means of ether alone. This etherial solution, by-the-bye, has the quality of gilding bright iron or steel by simple immersion only. It is with this tractable salt that we, as photographers, have mainly to do, as without it we could have no phosphate, citrate, or other of the exquisite and safe-toning baths we now use, and would have no resource save in sulphur—which we have happily been forced to learn, by bitter experience, the uselessness of—and perhaps platinum, which is comparatively powerless, and does not produce the fine tones of gold, besides being very much slower.

If we, as a young and practical society, had followed the natural routine, we should have had a paper on positive printing before one on toning, and it would have saved both you and I some trouble; as I must be allowed to say a few words on that subject before coming to the question of toning, and on gold as the agent.

Whatever may be the mode of producing negatives—whether the Fothergill of Mr. Burns, or the wet collodion of Mr. Nichol—we are all agreed as to the use of the negatives made, viz.:—to assist in producing good prints; and I am of opinion that the introduction of alkaline gold toning has caused most photographers to be more careful in the production of them, as it is a truth that, while a fair print might be got from a poor negative by the old processes, you cannot get anything like the same kind of quality from the alkaline gold process unless the negative be good, the prints requiring to be fully and deeply printed. I would also say, don't spare the silver. If you buy your paper ready albumenized, you may safely calculate that it is salted with at least ten grains of salt to the ounce. I think this too much, and never, when albumenizing, use more than from three to five: using ammonium by preference with this quantity, and with a 50 to 60-grain bath. you will get as fine prints as with an 80-grain bath and 10-grain salting solution.

In reference to the theory of toning by gold, my opinion is, that the action of the gold in the bath, in whatever way it may be made, whether by simple chloride, with a dash of alkali, or phosphate, or citrate, is similar to, if not identical with, the action induced by the galvanic battery: and that the gold is deposited on, and partly substituted for, the silver with which the paper was originally covered. Although I have not tested it yet, I feel certain that an appreciable

* Read at the Meeting of the Edinburgh Photographic Society, May, 1861.

amount of silver could be recovered from old toning baths if they were kept, resulting from the substitution of the gold for the silver previously on the paper.

I may mention here, without in the least attempting to claim any originality in the matter, that with the exception of a short erratic chase after Mr. Sutton's *sel-d'or* bath, when using the ammonia nitrate paper, I have never used any other than an alkaline gold bath, which is now a new discovery, and I believe that many others can say the same. I have now used it fully four years.

From the many forms which adulteration and short weight and measure assume, I hope I shall offend no one by saying that, as usually sold in the shops, you rarely if ever get the full value for your money. Tubes with a warranty of 15 grains of pure chloride are almost unknown; and it was this, together with not caring "to pay too much for my whistle," that first called my attention to the task of trying whether I could not cheapen its cost to myself. After trying the dissolution of various pieces of metal, from a half-sovereign to some old jewellery, I tried some gold dust in that state of minute sub-division in which it is brushed off the gilding of picture and mirror frames during the process of gilding them. Perhaps my business led me to it; at all events I found that the cheapest and best material for making it. It is usually sold for £3 per ounce, instead of £4 for sterling, or £4 to £8 for pure gold (which by-the-bye you must use for the hydrochloride of ammonia method of making chloride). It is of fine quality, nearly if not quite as fine as sterling; but in that state is only fit for the melting pot or for this purpose. To use it I proceed thus:—I take, say 70 grains of this material, which costs 8s. 6d., and which, with the addition of six pennyworth of acid, makes 100 grains at least of chloride, at a cost of not more than 1½d. The mode of doing it is this:—Take five parts of hydrochloric acid, three of nitric, and one of water. Mix and add the gold. If slow of dissolving, gently heat it, and in two minutes it will be ready for the next step in the process, as you see. It is now, however, impure, from the mixture of silver and copper alloy, which has also been dissolved, and there is sure also to be a surplus of acid used; therefore we must get rid of both, which is done by one operation, by simply neutralizing by carbonate of soda, which changes the silver and copper to carbonate of those metals, and leaves a residue of chloride of sodium in the gold, which is of no consequence to the toning powers of the article. If for immediate use, slightly over-neutralize it and filter, and you may use it at once, as I will do; if wanted to be kept in the solid state, the acid is driven off by evaporation and heat; if fluid, by determining your quantities you can, by adding water to make it, say one drachm to the ounce, keep it in that state. It is best to be kept in the dark. I have purposely omitted giving strict rules as to quantities, as you may vary within very wide limits; and would only advise, as you are never sure of the commercial strength of your acids, to always have a full allowance of hydrochloric acid, as it is the free chlorine which determines the dissolution of the metal.

Mr. Davies then proceeded to dissolve a quantity of the gold, from which, in a few minutes, he toned several albumenized prints. After which he stated that, had time permitted, he should have shown the other methods of using the material made, including the citrate of gold process—which is very beautiful and effective, but very wasteful of the chemicals, as they do not remain in action for any time—and also the chrysotype, a process which depends for its results on the reduction of a persalt of iron into a protosalt, but hoped that time would be found for that some other evening.

Dictionary of Photography.*

Pyroxyline—*continued.*—Amongst the varieties of soluble cotton, produced by the action of acids of different strengths and combined in different proportions is one to which Mr. Hardwich—who has given, perhaps, more attention than any other person to the manufacture and chemistry of pyroxyline—attaches considerable importance: we refer to that which he distinguished as being *parchmentized.* In the course of his experiments he observed, that pyroxyline which was made from cotton wool or bibulous paper which had been submitted to the parchmentizing action of dilute oil of vitriol, possessed distinct and desirable characteristics.

It may be desirable to explain, in passing, that sulphuric acid, diluted with half its bulk of water, has the property of converting unsized paper into a substance having nearly all the qualities of parchment, especially its toughness and closeness of texture. Pyroxyline made from this paper exhibited similar characteristics, and gives a collodion which is thus described:—

"The first noticeable effect of the previous parchmentizing, will be an increased fluidity and freedom from structural lines. The collodion when poured upon a glass sets very rapidly, and with such firmness that the finger may be rubbed backwards and forwards without disturbing it. The film on lifting from the bath soon becomes partially surface-dry, and repels developers or fixing agents; when washed with water and dried, it forms a dense and highly-varnished surface nearly impenetrable by liquids. The moist film after development with pyrogallic acid and fixing, appears unusually *tough*, and will bear pumping on without injury. It is also very contractile, and tends to draw itself away from the edges of the glass. When pushed aside it can be pulled back again like the finger of a glove. The fixing agent never removes any portion of the image from this collodion because the iodide of silver is *in* the film and not only upon its surface."

Having found these desirable qualities, it next occurred to Mr. Hardwich to secure the same results in one operation, by largely increasing the amount of oil of vitriol in the mixed acids. He found that the parchmentizing action of the sulphuric acid took place at once, before the nitric acid commenced its action of converting the cotton into pyroxyline, and that the cotton prepared in the mixed acids having a large excess of sulphuric acid, had similar characteristics to that which had been submitted to the parchmentizing influence of sulphuric acid before immersion in the nitro-sulphuric acid.

The manipulations for producing this pyroxyline we shall give in Mr. Hardwich's own words as given in the last edition of his "Photographic Chemistry," remarking, in passing, that the fullest treatise on the chemistry of the different samples of pyroxyline is to be found in that work. The cotton he prefers is the finest American grown cotton, which is gently boiled for two hours in a solution containing two ounces of potash to a gallon of water, and after thoroughly washing and drying is fit for use; the washing being intended to cleanse the fibre from oily or resinous matter with which he finds it often coated. Great care having been exercised in getting the acids pure of exact specific gravity, he takes as follows:—

Oil of vitriol, 1·845 at 60° Fahr.		18 fluid oz.
Nitric acid 1·457 at 60° Fahr.		6 fluid oz.
Water...		5¼ fluid oz.

"Pour in first the water, then the nitric acid, and lastly the oil of vitriol; obtain a perfect admixture by stirring, and take the temperature. If the thermometer rises to 165° Fahr. or 170°, the acid must be allowed to cool until it stands exactly at 150° Fahr. Then immerse the cotton in pieces well pulled out, and weighing thirty grains each, continuing to put them in singly until *ten* have been introduced, making 300 grains in all. This operation, together with the pressing against the sides of the vessel, etc., to be alluded to again presently, will occupy about a minute and a half, after which the vessel may be covered up and left for nine minutes. The process is complete in half that time, but the extra five minutes, although producing a little more solution of the pyroxyline, and consequently diminishing

* Continued from p. 303.

the weight of the product by about 15 per cent., produces a collodion which is less likely to show glutinous markings upon the glass, or to dry up speedily and repel the developer. Lastly, take out the pyroxyline in one lump with glass spatulas; squeeze out as much of the acids as possible in a porcelain capsule, and dash the whole into a large quantity of water.

"With regard to the temperature at which the pyroxyline should be made, the author worked at first at 140° Fahr.; but was eventually induced to raise it ten degrees, in consequence of representations that the collodion was somewhat deficient in fluidity. This increase of temperature, however, assists in generating traces of a body (probably nitro-glucose) which causes the collodion to lose its sensitiveness more rapidly after iodizing.

"An experienced person will be able to judge on lifting the cotton out of the acid, whether he has hit the right point. If, on attempting to lift out the whole mass of pyroxyline at once with the glass spatulas, it seems rather small in quantity and very rotten, so that little pieces break away and are left behind in the acid, then the temperature was too high, or the acids too weak, and in repeating the operation the water must be diminished by two or three drachms in the quantity of acid given above. If, on the other hand, the mass of pyroxyline appears large, sticks well together, and shows no tendency to tear, either the temperature has fallen several degrees, or it will be advantageous to work with a few drachms more of water.

"Whilst the pyroxyline is washing in the tray, it is still more easy to judge of its quality; for if the ten separate pieces, in which the cotton was originally weighed, are seen floating about, and can be separated and counted, the acids were certainly too strong; whilst if there be an evident aspect of commencing solution—a piece of cotton here and there scarcely changed, but the others in a measure broken up, and tearing easily under the finger,—the operation is probably successful; but when the whole is so mixed up together that nothing but fragments of the ten pieces can be detected, then the acids were too weak, unless the temperature was inadvertently allowed to fall.

"It takes twenty-four hours to ensure the proper washing of the pyroxyline, even in a slowly-running water which contains a portion of chalk; this carbonate of lime evidently acts in neutralizing the acid, and bubbles of carbonic acid gas form, which bring the cotton by degrees to the surface of the water, and keep it floating.

"After a thorough washing, the pyroxyline is squeezed in the hand, and then picked out to dry upon a cloth. A boy performs this part of the operation; and after a little experience, he can tell easily whether the material was properly made, partly by the extent of surface which it covers upon the cloth, but more easily by the readiness with which it tears under the fingers. If it resembles the original cotton in appearance, and feels strong and tough, the amount of water in the acids must be increased: but when it breaks up into little bits, it is correctly made, or else is somewhat too weak, in which case the fragments will mat together, so as to increase the difficulty of picking them out. As the pyroxyline dries upon the cloth, it will be well to examine it and give directions accordingly, separating any piece which appears less acted on than the rest; this piece was probably the piece put last into the acid and left at the upper part of the liquid.

"Two or three days' exposure to the air will render the soluble cotton sufficiently dry: but it is convenient to finish it off on the hot steam-bath before described, and the temperature in which must not be allowed to rise higher than 120° Fahr. When dry, proceed to weigh it in the scales, and form your estimate of its value accordingly. A long experience tends to show that, supposing nothing to be lost in the washing, the weight of the resulting pyroxyline is a certain and safe guide in this process, and it is always possible to tell what the quality of the collodion will be by using the scales. If 300 grains of cotton yield 450 grains of pyroxyline, it is certain that complaints will be made of the resulting collodion being thick, and giving streaky pictures: four or five additional drachms of water in the above quantity of nitro-sulphuric acid will be the remedy. When the weight of the pyroxyline is the same as that of the original cotton, viz. 300 grains, there will be a sediment on dissolving it in the mixed ether and alcohol; nevertheless the collodion, although lessened in quantity, will be good,—very limpid and structureless, with great adhesion to the glass, less tendency to markings of all kinds, and considerable softness of negative with sensitiveness to dark rays. The chance of spots, however, is peculiarly great with this collodion; for if the smallest particle of dust touch the film, it will almost certainly arrest the development, and produce a transparent circular mark.

"The weight which on the whole appears to be best is 375 grains, that is to say, exactly 25 per cent. of increase; this gives sufficient fluidity of collodion, and at the same time leaves very little sediment in dissolving.

"The above facts are quite reliable, since they have been verified by repeated observation, extending over a long time. It must, however, be distinctly understood, that the weight of the pyroxyline can be taken as a criterion of quality only under the conditions stated,—the fibre of the cotton must be cleaned by potash *and quite dry*, the nitric acid nearly free from chlorine, the time of immersion always the same, and, most important of all, the temperature correctly ascertained, otherwise the weight will be so variable that nothing can be deduced from it, and the cotton will be considerably acted on, even when the acids are strong enough to produce an explosive variety of pyroxyline. The whole process, in fact, requires care, because it is conducted with the maximum quantity of water, and at a high temperature. At least 20 per cent. of the pyroxyline is dissolved in any case; and the acids having once begun to act, will readily destroy the remaining portion of the fibre, if an error be permitted.

PHOTOGRAPHY AT LITTLE PEDLINGTON.

Letter the Second.

Strange Remark made by an Ignorant Londoner.—First Meeting of the Little Pedlington Photographic Society.—Rash Speculation.—Quotation from "The Pedlingtonion Journal."

Sir,—In fulfilment of my promise, I shall now enlighten the listening world with my brief historical sketch of the photographic art and science as associated with Little Pedlington. Before commencing this task, however, I wish to refer to certain remarks made by a gentleman of your town of London to a friend of mine, who has recently returned to this, his native place (and a very poor opinion of the former, as compared with the latter, has he).

"Sir," said this gentleman, "*there is no such place as Little Pedlington.*" (! ! ! !)

"What!" exclaimed my Pedlingtonian friend; "no such place? why, you will deny my own existence next!"

"I believe," said this strangely ignorant and shameless Londoner, "I believe that Little Pedlington is only to be found in the littleness of vain and ignorant people, and in their peddling ways of making an immense fuss about trifles. I believe, in short, that while Little Pedlington, as thus represented, may be found in every department of learning, and in every phase of human life, Little Pedlington, as a town, cannot be found anywhere."

Of course, I should only insult my readers by supposing them to be as ignorant as the above benighted individual, should I attempt to prove that Little Pedlington, "*mine own romantic town,*" * *is* situated in this or that county, *is* so many miles from this, and so many from that place, *is* reached by the coach, which runs with tolerable regularity between Little Pedlington and the Squashmire Gate Station three times a week, &c. How absurd would my doing so

* Sir Walter Scott.

appear, for, as I said in my last letter, to whom is little Little Pedlington a stranger?

What, indeed, would the departed spirit of Simcox Rummins, F.S.A.,* have said, and what will the tuneful author of Pedlingtonia say to hear of one who dares to deny the existence of—

> "That all-delighting, glorious spot, which Pedlington we dub,
> Where brightly *shone* a Rummins, and where brightly *shines* a Jubb,
> Which, dazzlingly resplendent, "homologates" the fame,
> And claims the birth-giving of those, whom just above we name."†

To return to my purpose. When—to quote again the immortal lines of the author just named—

> "Science withdrew the ignorance which wrapped a magic art,
> A light on silver plates did play its photographic part."

The earliest steps taken for the advancement of this art were those devoted to the formation of a society. We had at that time several eminent artists residing in our locality, not native Pedlingtonians it is true, nor to be compared with our *Daubson.*

> "Who drew the all-but breathing grenadier;"

but, nevertheless, gentlemen who took a very active part in organizing the new society. One became its president, another its vice-president, and others members of its council.

The first meeting night brought a full attendance of members. And our Vice President, Sir Simon Sharpton, read a paper in which that worthy gentleman, while urging the importance of good photographs, nevertheles asserted, that, if anyone preferred bad to good photographs, they should be permitted to produce such.

Thereupon great commotion ensued. Mr. Sirocle, of scientific repute, rose with the air of a giant who could crush, and had a great mind to do it, and he scowled intensely, or smiled in pity, on the V.P. while he spoke at great length to the following effect:—"He and the author of that paper differed in toto, as widely as light from darkness:" after which many other members rose and scowled intensely, or smiled in pity, also asserting that they too "differed in toto as widely," &c. Then certain artists rose and they said, "That they differed in toto as widely," &c. from the last speakers (who singularly enough all professed to be more or less scientific), and so they ultimately, after many words and much wrangling, concluded by agreeing that henceforth and for ever, they were determined to "differ in toto as widely," &c. And so were formed our first party feelings, the artists separating themselves from the scientific men, and the latter from the former, and both resolving individually and collectively that while they would always support their own party, they would always denounce the other party, such being in their opinion the most generous and noble line of conduct they could pursue as earnest men of principle, and active members of a society established for the advancement of the art and science of photography.

Just about this time a presumptuous Londoner, who had come into our peaceful and beautiful little town, to claim some property left him by a deceased relative, rashly ventured to start a journal in opposition to our far-famed old established papers the "Little Pedlington Weekly Observer," and "The Little Pedlington Dictator," which he called "The Pedlingtonian Journal."‡ In this journal, after a description of the above meeting occurred the following insolent and insulting remarks.

"For the establishment of a good understanding it must be remembered by these gentlemen that photography is an art as well as a science, and that the progress of the same is as much dependent upon the representatives of the one as of the other element. Perfection in this art will therefore be the result of harmonious combination amongst themselves; but, if influenced by the selfish feelings of jealousy, or the petty desires of vanity, these representatives waste their time in contemptible bickerings and squabblings for personal prominence and power, or mere efforts for fruitless victories, the gradual downfall of the society and degradation of the art it is established to serve must be the inevitable result. We are sorry that in ushering our new society into existence these facts appear to have been overlooked, and we hope that the serviceable gifts of art and science will, by virtue of their common aim and end, be harmoniously united at its future meetings. We remember reading in an old number of the *Spectator* the following remarks, which we recommend the gentlemen concerned in the above discussion to peruse. 'We find that there is a sort of economy in providence, that one shall excel where another is defective, in order to make men useful to each other, and mix them in society. This man having this talent, and that man another, is as necessary in conversation, as one professing one trade, and another another, is beneficial in commerce. The happiest climate does not produce all things; and it was so ordered that one part of the earth should want the product of another, for uniting mankind in a general correspondence and good understanding.' Looking at photography in this light we must again express our earnest hope that its evident mission will not be set at nought by such feelings as were displayed after the reading of Sir Simon Sharpton's paper."

I beg pardon for inflicting so long, tedious, and absurd a quotation upon your readers, but isn't it folly to suppose that such men as Sirocle, and those forming his party, don't know everything, that mere artists—acknowledging as Sir Simon Sharpton did, that he was not a scientific man—should be able to teach *us scientific* men, who know all about cameras, and baths, and lenses, and how to produce pictures. If I can talk to you about the chemical elements, metallic and non-metallic; about mixture, combination, and chemical affinity; about bases, acids, salts, double decomposition, &c., and can moreover discourse about double or single concave and convex, meniscus and aplanatic lenses, &c., &c., &c. In short if I have had half-a-dozen lessons in geometry and optics, and have some practical acquaintance with photography, who shall presume to talk to me about art? or insinuate that there is anybody who can teach me anything?—I am, sir, yours most respectfully, Tripod Cameron.

West Street Lane, Little Pedlington, June 21, 1861.

* See "Little Pedlington," by J. Poole, Esq., published by Routledge, Farringdon-street.

† "The Bright Spots of Earth," a poem by J. Shakespeare Spriggins, Esq.

‡ The folly of the attempt soon appeared when this rash speculator dared to decline the services of Saphho Cripps, dared to ridicule Daubson's Grenadier, absolutely declined to treat with Jubb for his great Epic poem in 265 cantos, and insulted several respectable tradespeople who sent him small presents which he returned with sarcastic thanks.

GEOMETRICAL ILLUSTRATION OF THE HARMONIC RELATIONS OF LIGHT AND SOUND.

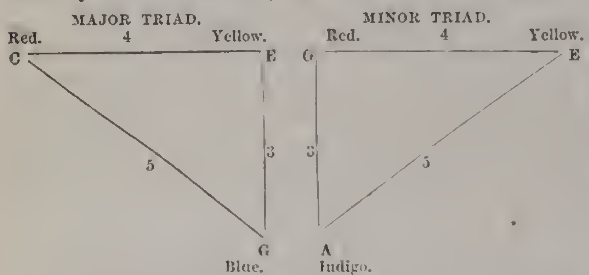
BY S. D. TILLMAN, A.M.*

In the course of my investigations concerning the relation of light and sound, and the analogy between the primary colours and the common chords, I have found a new method of representing the arrangement of musical intervals which possibly may lead to a clearer view of the relative position of colours. It is well known that in the tempered system of intonation common to all keyed instruments, only twelve different intervals are used within the octave, which consecutively form the chromatic scale. Theoretically, but not practically, these intervals are equal, and the scale of sounds may be represented in space by twelve grades of equal length, each of which measures what is erroneously called a semi-tone. In adapting the colours of the spectrum to this measurement of the septave, the lowest sound must correspond with the colour made by the lowest number of undulations and from that point each will follow in the natural order; that is, the red ray will coincide with the tonic, the orange with the supertonic, the yellow with the mediant, the green with the sub-dominant, the blue with the dominant, the indigo with the sub-mediant, and the violet with the sub-tonic.

In measuring the intervals forming the major common chord or Triad, we shall find from the tonic (red), to the

* Read at the American Photographical Society, June 10, 1861.

Mediant (yellow), four grades, or chromatic intervals; from the Mediant (yellow), to the Dominant (blue), three grades; and from the Dominant (blue), to the Octave tonic (red), five grades; making together the twelve chromatic intervals. In order to give distinctness to this measurement, I represented the length of the intervals of the triad by the sides of a triangle, and immediately discovered that one of the angles thereof must be a right-angle The intervals of the major common chord and the minor common chord are correctly measured to the eye in the following diagrams.



In the triad C is the tonic, and the intervals progressing upward are measured by 4, 3, and 5. In the minor triad A is the tonic, the upward or direct intervals being measured by 3, 4, and 5. In the one we have $4^2 + 3^2 = 5^2$, and in the other $3^2 + 4^2 = 5^2$. If these intervals in a true temperament are measured by the more minute divisions known as commas, 17, 14, and 22, will mark respectively a major third, a minor third, and a fourth, corresponding with 4, 3, and 5 of the tempered system. The sum of the squares of 14 and 17 is 485, and the square of 22 is 484. This variation of one comma in the result simply proves that the intervals of the octave cannot be precisely measured by true thirds, and it may be practically shown by the violin that twelve fifths taken consecutively upward will reach a sound exceeding in pitch that reached by seven octaves measured upward from the same fundamental.

For all practical purposes, the right-angled triangle whose sides are as 4, 3, and 5, may stand as an index of the intervals forming the major common chord, and likewise show the relation of the three primary colours; while the triangle having sides as 3, 4, and 5, will show the relation of the intervals of the minor common chord, and of a triad of colours in which the indigo or darkest ray is substituted for the blue; this relative arrangement producing up through the eye the same depressing effect that reaches up through the ear by the use of the minor mode.—*American Journal of Photography.*

IODIDE OF SILVER CRYSTALLIZING FROM NITRATE OF SILVER A CAUSE OF DEFECT IN NEGATIVES.

BY L. M. DORNBACH.

NITRATE of silver in solution dissolves iodide of silver in variable proportions corresponding to the degree of saturation, or strength of solution and the temperature at which the bath is saturated with the iodide. Hence, when a silver solution that is quite strong—say 40 grs. and upwards to the ounce—is charged with all the iodide of silver it can take up, and the temperature of the bath should afterwards fall several degrees, the excess of iodide of silver, corresponding to the difference of the two degrees of temperature, will crystallize out in the form of small tetrahedral and octahedral crystals, which adhere to the sides of the bath and also upon the plates introduced, which will then exhibit small holes after being fixed. This annoyance is more generally experienced during the winter season.

The remedy for the difficulty is, to filter the bath from the crystals of iodide of silver deposited, after which no more will be likely to form; or, after saturating the bath with the precipitated iodide and filtering it, add about one fluid ounce of the silver solution which had been set aside, and which does not contain any iodide of silver.—*Humphrey's Journal.*

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 24th July, 1861.

IT is probable that it would prove not an unprofitable task to take up the rejected agents in photography, and submit them anew to investigation. It would, doubtless be found that some among them have been rejected on insufficient grounds, or have fallen into disuse by the more prompt and temporary success of rival agents.

When glycerine was proposed as a preserving agent for collodion plates, we were sanguine that it would prove a useful adjunct, quite as good, in fact, as honey or raspberry syrup. Why it fell into abeyance we cannot divine. But it is just one of those things that is worth looking after, to see if it has not been unjustly slighted. M. Gaudin has laudably attempted to resuscitate it. Recently, you had his experience in adding it to the nitrate bath; he has now experimented by adding it to the collodion itself, and with results that must be regarded as curious and encouraging. He further proposes to try the effect of adding it to the developing agent.

The same experimentalist has also come to the conclusion that collodion, to be in good working condition, must be acid, or have free iodine present in it, otherwise veiled, or fogged pictures will be the rule rather than the exception. Thus it appears that collodion, nitrate bath, and developing agent, must each and all be in an acid condition. Mr. Gaudin's account of his experiments with acid collodion will be perused with interest.

It is rumoured that M. Niepce de Saint Victor, ardently pursuing his researches in heliochromy, has succeeded in producing colours in great brilliancy with a greater degree of permanency than has hitherto been obtained. The coloured images, it is said, will resist the action of strong sunlight for several hours. We know, from past experience, that a very little success goes a great way, when photography in natural colours is concerned, and if M. Niepce succeeds in attaining the promised result, it will be against hope. It is assumed that the pictures in natural colours will in every particular, be true to nature, with all the harmony of hues and tones, and with due gradations. A faint tinge of green in one place, of blue in another, and red in a third, although they may occur in spots representing tree, sky, and tiled roof, will hardly be accepted as a satisfactory solution of the great problem of photography in natural colours. And these results are the most that has been displayed at present.

Photography, it must be admitted, is a difficult art, although its manipulations are now tolerably sure and easy. It cannot surely be necessary to enter upon the much vexed question of photography as a fine art, for such it is admitted to be by all rational and reasonable minds. I do not despair of seeing the productions of those photographers who, by their works have proved themselves artists, fitly placed in the forthcoming Great Exhibition. But photography would suffer no harm, even if its products were mingled with mining and agricultural implements; our art would suffer no derogation, while the implements would be honoured by the association. I say, let the executive put the photographs where they will, so that they can be seen: they will be none the less photographs and works of art. Those who would reject photography from a place among the fine arts may justly be suspected of knowing nothing either of Art or of photography, and the profounder this ignorance, the greater the obtuseness and obstinacy.

Your executive should come and see how much better they manage these things in France. I believe the humblest artist would resent as ridiculous the question, "is photography a fine art?" if it were put to him. Like painting and sculpture, it is true, photography is, in some hands, a manufacture; but when its operations are directed by intelligence and refined taste, and evince a knowledge, in the person of the operator, of the principles of art, both in selection and rejection, then must the products have just and full claims to be regarded as works of art.

No person can walk through our present photographic Exhibition, and entertain any doubt of the title of photography to rank among the fine arts. If he has eyes to see, he will encounter pictures in which the profoundest knowledge of art is evident,—in the pose of the model, in the harmony of the tones, in the richness of the colouring (or rather of the *chiaroscuro*), and in the selection of the most favourable point of view. There are abundant photographs in which every particle of feeling for art is absent; but there are as many pictures and works of sculpture which exhibit the same deficiencies, and neither one nor the other should take rank among the products of artistic genius, but are strictly to be classed among manufactures. Those whose power of discrimination happens to be weak, admit *every* product of the pencil and the chisel—no matter how deficient in true artistic qualities—to be ranked as works of art, and in this lack of discrimination lies one of the greatest foes to true art.

A feeling is gaining ground among our most intelligent photographic artists, that the best results are to be obtained by pictures enlarged from very small negatives. Landscapes so produced avoid the difficulty arising from the varying foci of the different planes, while in single figures and groups, far more harmony, and an almost complete absence of distortion is secured, while the expression, which generally escapes from the model during a prolonged sitting, is almost certain to be secured in a negative of small dimensions requiring but an instant's exposure.

M. Gaudin has published a ready method of reducing silver from baths, &c., in a very pure state, from which nitrate can be re-formed. He states that of all the methods he has employed, it is much the most expeditious and the best. Previously, he reduced silver from its chloride by means of zinc and diluted sulphuric acid, then the salt of silver itself by zinc, after having acidified it with nitric acid. This latter method is very expeditious, but the reduced silver is always mixed with acetate of silver, which upon being dissolved in nitric acid, produces a magma of a brick-red colour, which dissolves with great difficulty in water, and makes very bad bath solutions. The silver reduced from the chloride is the best, but there always remains some chlorine not acted upon.

In reducing the chloride by the new method the nitrate of silver obtained from it is very pure, and the reduction is made with the greatest facility, when small quantities are operated upon, which is the only condition in which the process is applicable, and, therefore, especially useful to amateurs.

After having reduced and washed the chloride of silver obtained by adding hydrochloric acid to the ordinary silver baths, and dried this chloride upon a filter, it is placed in a hollow made of a piece of carbonized wood, and covered with ignited charcoal in a crucible, and a stream of air directed upon it from a bellows, so that the flame of the charcoal is directed upon the chloride; this soon melts; then, continuing the blowing, it is very quickly reduced to a button of metallic silver, entirely free from lead, which is almost the only metal that gives an insoluble chloride, like silver. The operation is completed when the chloride ceases to give off a white smoke.

PHOTOGRAPHY IN AUSTRIA.

Sir.—Observing that a portion of an absurd letter which appeared in the *Times*, has found its way to the Photographic News, and is calculated by implication, to give an erroneous impression of the treatment of photography in the Austrian dominions, I take the liberty of informing you that during a recent visit of some weeks to the Venetian kingdom, I never found any but the greatest courtesy—the only notice taken of my performances by the police, was to prevent people going in front of the camera! I have thought this might be acceptable to such of your readers who may visit the Queen of the Adriatic, than which few places afford such food to the photographer.

As the letter in the *Times* referred to treatment at the frontier, I may mention that when at Peschiera I requested the Austrian official to open my photographic box with care, he immediately closed it again, saying he would not risk doing any harm.—I remain your humble servant,

A Constant Reader.

July. 1861.

HYPO *versus* CYANIDE.

Sir,—I enclose for your inspection a stereoscopic plate, one half of which has been fixed with cyanide, the other with hyposulphite of soda. The plate was cut through with a diamond before exciting, and exposed in a bi-lens camera; it was then developed, and afterwards broken in two and fixed, as I have before stated, one half with cyanide, the other with hyposulphite.

The negatives were then placed side by side and printed on a piece of paper. The negative fixed with cyanide is rather whiter on the surface than that fixed with hypo; but there is not that difference in apparent intensity I had been led to expect. You will observe that the hypo negative retains its creaminess on both sides, while the other is creamy only on the side next the glass.

The prints, as you will see, give the effect of a slight difference in exposure in the negatives, the hypo negative seeming most done. The collodion used for this experiment was one containing a large proportion of bromide, and the bath contained an acetate.

I was somewhat surprised at not finding more apparent difference between the hypo and cyanide; but in the printing the result is decidedly in favour of the hypo fixing, the print being rounder and more delicate, with less tendency to harshness in the contrasts. In some instances I have found a more marked difference in the results, but always in the same direction. Please make any comment no these remarks you may think advisable, and oblige, yours, &c. J. C. Leake.

THE "HELIOGRAPHIC PRINTING" PATENTS.

Any means of repeating by lithographic impressions the beautiful half-tone and delicate light and shadow of a photoghraph is certainly much to be desired. The best attempts I have seen, however (and one or two were certainly very fine), have fallen very far short of the mark, and leave very much to be done in that direction yet.

All the attempts I have made have been so far deficient in delicacy, when looked at beside the photographic impressions of same subjects, that I abandoned each trial with a certain measure of disgust and began some other process which I thought would succeed better, in its turn to be discarded also, and have yet got no results fit to show publicly. I have tried all the methods specified by these patentees (and many others) and almost despair of getting rid of the *granular* appearance they all produce—which, though it *might* be tolerated on a very large picture (on perhaps a rustic subject), would never do for a small picture, or where very soft tints and distances are necessary.

It is a pity these gentlemen, instead of trying to help us on, either to something new, or to some other and better means of treating the old methods of accomplishing these desirable ends, entramelling progress by even patenting what is already known in that field of investigation.

After telling us that they do not "claim generally the use of bichromate of potash, &c.," they tell us what they "do claim," and, unfortunately, what they "do" claim is nearly all as well known to those practically acquainted with photolithography as what they do not "claim generally."

The 1st, 2nd, and 3rd claims as to the use of ordinary lithographic transfer paper, and the coating *it* with bichromate, &c., is no novelty; I have used every modification of transfer-paper, with gum tragacanth, isinglass, rice-flour paste, starch, &c., &c., long ago, and would not now think of using much less patenting them, as much better methods are well known, and I have no doubt every *lithographer* who has tried photo-lithography has begun the transferring of his impression from his own transfer-paper. "Hard surfaces free from granular texture," have also been used, if plate-glass, and copper, steel, brass, and zinc plates are to be considered such, and "dextrine," "gelatine," and "albumen," are certainly thoroughly known, as well as many other kindred substances that have been used for the same purpose long ago.

The 4th claim of mixing "pulverized mineral and earthy substances" with the compositions is no novelty either. I have tried silver sand, flour, emery, powdered charcoal, brick dust, and many others, which all produce (and naturally enough), but variations of the same granular and mealy effect.

The fifth claim, about the aqua-tint grounds, &c., transferred to the impressions has been, *in effect*, published by Fox Talbot in his "Engraving Processes," and similar means have been recommended by S. Pretsch for the galvanographic process, as well as ruled lines, dots, &c., and there is some *reason* in this case, as the most *delicate* aquatint shades will bite into and print from the plate, but will not transfer to the stone without either becoming gross and rough, or disappearing entirely. I have tried a great many methods for that purpose. I enclose a small piece of a ground I used which succeeded pretty well and could be made close and fine, or coarse and rough as desired; but ruled lines (done by the machine), and crossed various ways produced certainly the nearest approach to the thing of any.

The sixth point claimed as a novelty that of producing prints in colours is just about as old as lithography itself.

The seventh, and last item claimed, that of coating the picture (when done on metal), with "acid-resisting varnish" so as to bite away the metal and leave the picture intact and thus get a plate to print from, is by their method not worth claiming, seeing you can coat with etching ground and bite in the picture *without* the bichromate composition being between the varnish and the plate (as in their method) and so can bite deeper and with greater certainty. I have sawn off a small piece of a plate, which I send you, done in that way a considerable time ago, and have done it often. It needs considerable *depth* for surface printing.

The only thing really new, I think, in the specification is the coating the lithograph stone with a hardening surface of silex, &c., which must be necessary where the bichromate preparation is between the stone and the ink, but when it is best to put the picture on the stone itself, so that the greasy matter of which it is composed is in actual contact with it as in the usual printing method, the hardening is unnecessary.

Of course these gentlemen may, by the methods others fail at, be able to produce valuable results, and I should rejoice to see it, and be the first to laud these efforts even though at first they did not arrive at perfect success; all I object to is the claiming as their own property and invention means and appliances which have been known and used by others who are at work in the same field of investigation.

I enclose you one or two *line* subjects which I have done, and for which in our present state of advancement it seems best adapted. James Ramage.

OPTICS AND PHOTOGRAPHY.

Sir,—If your correspondent "A Photo-Student" (see page 331) is really ignorant about lenses, he will find it much easier to get popular information about the optics of an object glass for a telescope than about a portrait lens, and the first will help him not a little. Let him read such works as "Dick's Practical Astronomer" in default of higher food. Still I quite agree with him that we do want fuller information about our lenses and about every other subject. Your valued correspondent, Lake Price, gives diagrams in his work which are very useful; but in trying a lens I want to know "*how much*" to expect from it. For a given diameter and focal length what depth of focus in inches? What flatness of field in inches at a given distance? If Mr. Price had added definite details, one would have had something of a standard to go upon, but I may call a lens flat, and another may call the field round. I have not the opportunity of trying them by the dozen. Then, again, in what ratio to the focal length ought a good lens to work without a diaphragm? If I try a telescope, I go by certain ascertained rules, and soon pronounce an object glass or a speculum good or bad—the same with a microscope—but for a portrait lens I am not aware of any standard of judgment. Let your learned correspondents see to this, for the days of guess-work are fast fading away.

Birmingham, 24th July. J. Davis Burton.

Sir,—There is an article in your journal of the 12th inst., wherein I am attacked in such a manner that I think your readers will coincide with me in designating it a gross and unprovoked insult, and written with the intention of verifying the words of Shakespeare, "But he that taketh from me my good name, steals that which enricheth him not, but makes me poor indeed;" and that by an anonymous scribe too. Therefore I write this reply, not doubting but you will see "fair play" by inserting it in your next. Your writer having thrown down the gauntlet to me, I request you to give me his name: if you have it not, I call upon him to do so, that, in the contest he seems desirous of provoking, I and your readers may see the sort of antagonist with whom I have to do.

I certainly was somewhat astonished to see such a self-contradictory, confused trash inserted in any photographic journal, in which the writer has delineated his own likeness, and which, according to recent additions made to our knowledge of zoology looks very much like a "Gorilla," and in which he makes so free with other men's names (and reputations), without giving his own; the right epithet for such conduct comes at once to the tongue's end. I presume it must have got into the Photographic News by one of the youngsters in the office—either by design or accident—having picked it out of the waste-basket from among similar rubbish, where the editor throws such *stuff*—taken it to the type-setter, and thus I account for its insertion.

I now analyse the trash. In the first part, the writer states two or three times over that there is a disinclination to go into optics, to evade the subject. I believe him so far as he is concerned, or he would have had no need to come before the public *crying* for *simple* information, after having read valuable papers which *he* did not understand—in fact, almost all that has been written on the subject. His intellect must be the next link below the human, something like the zoological specimen above-mentioned. He does not want it learned and bewildering like Sutton's, neither must it be trashy like mine; then come Jupiter, come O ye optical gods, and give the exact *simple* information this stick-in-the-mud would-be optician is in search of. Man alive, put your shoulder to the wheel, apply yourself industriously, perseveringly to the study of optics, and *perhaps* you will get out of your miry incapability of understanding.

In another part of his precious confession, he advises me to go to school, and thinks the information will be singularly useful to me. What information—that which he gives or what I should get at school? If the latter—the former I will try to "make shift" without—I must take it as a compliment. He thinks I *am* capable of learning, which, I regret to remark, I cannot say as much of him; for he has read almost everything optical, and yet remains in a non-understanding slough of despondency.

Photo-Student wishes to know what a lens really is, and in what consists its real goodness. Reader, digest those two questions, and read the "bosh" of which the whole of his last paragraph is composed, and then remember *that he has read nearly all that has been written on the subject*, and draw your own inferences as to the effect his schooling had on this self-constituted judge on optics. He asserts that the chemical and mechanical portions of the science are pretty well understood; are they? If he understands them *well*, I am sure he would have been better employed in imparting that knowledge to others, than in exposing his want of *simple* information.

Photo becomes quite learned; at any rate he knows a little when he comes to speak about my papers. He can see that I know nothing—worse than nothing. My papers, in portions, are full of errors; in fact, from not knowing the A B C of optics, he has now become a judge, competent to pronounce the papers nonsense; yes, but they are composed of such nonsense that he, with his *affected* ignorance and real skill, whatever that may consist of, cannot controvert a single point in them. I here challenge him to prove (and surely he will not refuse it, after his bombastic, dogmatic condemnations) argumentatively or by experiment, a single error in the six papers now published, and leave every reader to judge for himself. All I desire is that every photographer examine the arguments and assertions I have made, and try the experiment stated in my papers, and if they do not find all I have stated correct, then I will admit that the notices of dissent by the editor of the "British Journal" are worth "paying attention to."

Mr. Editor, I believe you are right, when you say you suspect he has more general information about the whole subject than he confesses to possessing. If such is the case, what is his object in sending you the communication at all? Can you make anything out of it but an intention to attack me and depreciate my papers, in an indirect way, and that a very vile one; for if his ostensible motive (acquiring information) had been his real one, he had no occasion to drag my name forward, and make the insolent, unfounded, *unproved* assertions he has done.—I am, Sir, yours truly, J. Rothwell.

1, *Hulme Hall Lane, Newton Heath, Manchester, July* , 1861.

[As Mr. Rothwell feels himself aggrieved, we, as in duty bound, admit his reply, although we cannot but regret that so much of it consists in mere epithet. "Calling names," as children phrase it, really serves no purpose. The "Photo-Student," in confessing his want of optical information, and complaining of that already in existence, expresses his opinion of the labours of Mr. Rothwell in terms which it may be admitted that gentleman may have some right to complain; but we think he is entirely in error in conceiving that there is any special animus regarding himself. "Photo-Student's" complaint is a sweeping one, and seems to comprehend every one who has any optical knowledge, either for what they have done or what they have left undone.—Ed.]

Photographic Notes and Queries.

The Soidisant Gorilla.

Sir,—Having been a subscriber to the Photographic News from the commencement, and an occasional reader of all the other photographic periodicals, I was startled the other day by meeting with a letter in your Liverpool contemporary, headed "Photography by Machinery," and signed "The Gorilla," intimating in unmistakeable terms that a recent paragraph in your "Talk in the Studio" regarding the specification of Mr. C. F. Flounders of Liverpool, was a fabrication; stating in so many words, that you were either the victim of a hoax, or were wilfully hoaxing your readers.

Now, Sir, you will pardon me when I admit that I muttered to myself the old proverb, "Once bitten, twice shy," and resolved if I had been "sold" by the News once, I would not be "sold again;" for when one's reliance in an Editor's good faith is shaken, it is not, I fancy, of much use to waste time in continuing to read his paper. I resolved, however, to take the simple steps of satisfying myself, as it happens that I have considerable interest in such mechanical applications. I went, therefore, to the Patent Office, and having, with some hesitation, made the necessary inquiry, I received, instead of a curt negative, a specification containing eleven folio pages, "bristling with figures," and bewildering descriptions of intricate machinery, together with a broad-sheet of diagrams, in which "Charles Fontayne Flounders of Liverpool, Lancaster, "sets forth the nature of his invention for "duplicating photographic impressions, and also for certain machinery for the same."

Well, Sir, what are we to think of a journal, the conductor of which, neglecting to take the simple trouble of verifying a statement interesting to its readers, gives insertion to a letter denying the existence of Mr. Flounders altogether, declaring the whole affair a hoax, and at the same time gives a certain amount of editorial sanction to this letter by calling attention to it in the answers to correspondents?

"The Gorilla" truly states that the announcement of a photographic patent by a Liverpool man might have been expected to have appeared first in a Liverpool journal; but because it did not, does it mend the matter to add misstatement to neglect, and endeavour to deny a fact?

Where is the hoax, Sir? Not with you; for I have the specification before me. Has Mr. C. F. Flounders gone to the expense of not less than £50 for the sole purpose of hoaxing you? Or is it a hoax or something worse on the part of your contemporary?—Yours, &c., A London Photographer.

P.S.—I cannot forbear asking if the conductor of your contemporary had not at one time a great objection to the bad taste of what he termed "nominal designation," when referring to a brother editor, and may I ask your opinion of the singular taste or peculiar aptitude with which the correspondent in question writes himself down "The Gorilla?" L. P.

[The whole business displays a piece of "singular taste," upon which we have little disposition to comment, nor will our readers deem it necessary that we should do so. There is possibly more aptitude in the *nom de plume* assumed by the correspondent in question than you dream of. The editor of the journal had, and we believe has, an objection to the practice to which you refer, and, if we estimate him correctly, you must not charge him with complicity in such a silly business. There is "a power behind the throne greater than the throne itself."—Ed.]

Packing Dry Plates.

Sir,—I purpose taking a photographic tour of about three weeks: my plates are to be prepared by the Fothergill process: I should be glad to know whether I can safely pack them in a parcel with slips of *writing* paper between them; or whether I must increase the amount of my impediments with boxes which will also occupy considerably more space than a parcel.

Perhaps *blotting* paper would be better than paper such as this?

I should also like to be informed of the purpose of the addition of citric acid in the albumen, as recommended for the Fothergill process in the Photographic News Almanac.—I am, sir, yours, &c., Fothergillian.

Westminster, S.W., 22nd July, 1861.

[The neatest and most compact method of packing sensitive dry plates is that adopted by Dr. Hill Norris in the plates sent out by the Patent Dry Plate Company. A strip of cartridge paper is folded alternately, each way in folds about a quarter of an inch broad. The plates are packed in dozens with a fold of this paper between each plate at the end, the sensitive surfaces facing each other. The paper is really made to form the grooves of a plate box; and when a dozen plates are thus arranged, they are tied tight with a piece of string and packed securely. A great many plates are thus secured in small compass. Do not attempt to place any kind of paper in contact with the whole of the sensitive surface; but each negative as it is completed and varnished may be packed with paper next the surface. The addition of citric acid in the formula named, forms citrate of ammonia, and this tends to convert any trace of free nitrate into the citrate of silver, aiding keeping qualities and clean development.—Ed.]

Historical Parallel.

Sir,—May I venture to ask if there is not a very striking historical parallel to be found in the remarks of a certain photographer, as recently published in the Parent Society's journal, and the following as made by another eminent personage?

"*Dogberry*—Dost thou not suspect my place? dost thou not suspect my years? O that he were here to write me down —*an ass!* but, masters, remember that I am an ass; tho' it be not written down, yet forget not that I am an ass. * * * * O that I had been writ down—*an ass!*"—*Much Ado about Nothing*, Act 4, Scene 2.—Yours truly, A Photographer.

Talk in the Studio.

Photographic Micrometers.—Micrometers have been constructed by the aid of photography by Mr. Clarence Morfit of New York. He has thus succeeded in reducing a scale of ten inches divided into tenth parts of an inch to the length of half an inch. This method of reduction promises to be the most simple and economical hitherto devised.

Photographic Colouring.—Circumstances having induced Mr. Wall to dispose of his premises in Old Bond Street, he requests us to say that all future commissions should be sent to his private address, No. 11, The Terrace, Walworth Road.

Art Photographs.—We received from Messrs. Jackson, Brothers, of Jumbo, near Manchester, some further specimens of their choice photographs of rural life, in all of which the same careful attention to the composition of the picture, harmony of tones, and general chiaroscuro to which wer eferred a few weeks ago, is manifested. From subjects which are in themselves the most unpromising, the most effective pictures are produced. Here, for instance, is a "Rustic Porch," not formed of grotesquely twisted branches intertwined with jasmine, honeysuckle, or climbing roses. Not a vestige of foliage is present, but a whitewashed porch to a rough-brick cottage, with every line of the squarest. It is approached by some tumble-down steps, bounded by some broken wooden railings. The picture is taken in sunlight, but there is perfect drawing in the whitewashed porch, as well as in the deep shadows. The straight lines of the porch are broken on one side by the figure of a child, whose drapery also just serves to break the contrast from the white porch to the dark bricks of the house. A child's dress hung on a nail to dry at the other side of the porch, admirably serves a similar purpose. The open door, which would otherwise be a mass of black shadow in the midst of the white, displays a mother nursing just within, and beyond a child sitting; these lead the eye right into the deep shadow and give it perfect transparency. We cannot enter into detail of every picture, but may mention a "Dry Dock" as another admirable composition. We should recommend those of our readers interested in art photography, to procure some of these photographs: as, independent of their interest as pictures, they are extremely valuable as studies of how much may be done with little means, where a right appreciation of art-guidance is manifested. The published price, we believe two shillings, appears to us to be ridiculously low for whole-plate photographs of such quality.

Life-size Pictures.—We have recently seen some solar camera life-size pictures which have been touched in black and white chalk by Mr. A. H. Wall. The phrase "touched" appears in this case a very appropriate one, as the amount of chalk added was so slight as to be almost imperceptible. The result was, however, amazingly effective: from the crude and somewhat coarse appearance common to too many solar camera pictures, the transformation was complete, and a fine rich mezzotint effect produced, with quite sufficient delicacy for pictures of such a size, and intended to be viewed when hung, and not examined as miniatures.

To Correspondents.

Fixing Process writes as follows:—"Sir,—The proposal of 'Acetic Acid' is not bad. Jeremy Bentham suggested that a copy of his fallacies should be painted on a board in the House of Commons, and that when a member tumbled in his speech on one of them, he should be checked by the Speaker, simply exclaiming and pointing to 'No. 1' or 'No. 10,' as the case might be. So, if in our societies a member gets out of his depth and begins to struggle, if the President were to exclaim 'Gorilla,' the member might be saved from drowning himself, and taking the hint, would no doubt clutch at his seat, and become silent. How many would thus be preserved from the danger of getting into deep water."

G. G.—We think it probable that under the circumstances you name, a coating of gallic acid may add to their certainty. We are glad to learn that you succeeded with your camera.

Dr. Hanlon.—The glass shall be duly examined. We observe it is a flashed glass, which is not best in principle.

Investigator.—We have repeatedly given the methods of separating silver from waste solutions; you will find the subject treated at length in page 50 of the present volume. Unless you use very large quantities of gold in toning, it will be scarcely worth the trouble of attempting to recover it. Any gold remaining in the toning bath may be precipitated by means of photosulphate of iron; but it is best to use no more gold solution at one time than you are going to exhaust, as nearly as possible, in toning.

H. W. Ball.—The tendency in the film to leave the glass, may be produced by several causes. An acid nitrate bath will often cause it, as will also a very contractile collodion. Developing in a dish instead of pouring on the developer will also tend to the same result, especially if the former causes are present. To avoid it, without altering your bath, be careful to allow the film to set well before immersing the plate in the bath; be certain that your plates are clean, and let the collodion run well up to all the edges of the plate; you may also slightly roughen the edges. If these means fail, try a fresh sample of collodion, or add some fresh nitrate solution to your bath.

Tit tat to.—We are not quite certain from your description of the nature of the defect of which you complain. If, as you state, there is a want of sharpness in some parts of the print which are quite sharp in the negative, it can only arise from a want of perfect contact in the pressure-frame between the sensitive paper and the negative. If the contact be not perfect throughout, the print will not be sharp in the places where the pressure is imperfect. Probably the addition of another piece of soft elastic felt behind the sensitive paper will remedy the defect. If this be not the cause, you must send us a specimen, and we will further help you.

Y. W.—You have done right in making your gold into one solution, and your phosphate of soda into another, to be kept separate, and mixed when required. We cannot tell you whether the quantities of each solution you name are right, without knowing the strength of the solutions. If we remember correctly, you some weeks ago referred to the strength of the solutions; but we cannot remember the figures mentioned in all our correspondence. You may, however, mix the smallest possible quantity, by adhering to the proportions named in the formula. The colour of the background in your pictures will be regulated by the colour of the screen you use for a background. If you require a dark background paint the screen a dark grey.

J. S. L. P.—Omit the muriatic acid from your formula. Let your pictures be slightly under-exposed, and well developed in the first instance, and you will have less tendency to blueness in the further operations. The solution sold by the house of whom you purchase the varnish does not, we believe, produce blueness.

H. B. Y.—You may use your portrait lens for landscape purposes, if you place a diaphragm between the lenses; one of about a quarter of an inch diameter will be small enough for a quarter-plate lens. If you use the lens in this manner the same camera will do. Or you may use the front lens alone, reversed, if your fittings permit of the arrangement. In that case you would require a camera to extend more, and the lens would cover a rather larger plate. 2. Precipitate your old silver baths with common salt, and either take the chloride thus formed to a refiner, or reduce it to the metallic state in a crucible with strong heat, adding twice its weight of a mixture of carbonates of potash and soda. 3. The only method of effectually screening a sitter from the sun in a glass house, is by a series of blinds inside, any of which can be drawn at pleasure.

An Amateur Photographer.—You may use the oxide of silver for the purpose without necessarily having it freshly precipitated. Shake a little up in a small quantity of water in which it will be held in mechanical suspension, and add a few drops to the bath, which must then be well agitated. This will neutralise all the free acid; then sun the bath and finally filter and acidify. The oxide of silver is prepared by adding caustic potash to a solution of nitrate of silver, a little at a time, until the whole of the silver is thrown down as an olive brown powder which is the oxide; after well washing, it is ready for use.

N. H. W.—The general plan of your glass house is good. If you can afford two or three feet more in height, so as to secure a height of 13 or 14 feet, it will be an advantage. Presuming that your sitter will be placed at the end where there is six feet of wood overhead, we should recommend you, if possible, to have a little more glass at one side of the house, and instead of 10 feet of wood, have only 6 feet at one side. This will often be an advantage in illuminating the lower part of the figure in carte de visite and standing portraits. For the rest the plan is very good. We should prefer to use the white sheet glass to blue. The fluted glass is the very best thing for the sides. Regarding mounting your lenses for a stereoscope, it does sometimes happen that a facility in varying the distance is valuable, but about 2½ in. or 2¾ in. from centre to centre, suits most persons. It will be useful to have an adjusting rack to alter the focus. In placing a diaphragm between lenses, the position is determined by the respective focal lengths of the front and back lens. Thus if the focus of the front lens be 6 in., and that of the back lens, 12 in., the stop should be placed about one-third of the total distance between the lenses behind the front lens.

J. C. Barnard.—It entirely depends upon how much you already know, and how much you need to learn. If you call upon us next Thursday afternoon we will endeavour to aid you.

R. Keene.—We will endeavour to ascertain for you by next week.

R. C. R. B. J., India.—Many of your queries are answered in former numbers which will by this time have reached you. The redness of the image on first developing, and the loss of density in fixing, seem to indicate the use of an old decomposing collodion. The loss of density in fixing sometimes takes place from the collodion being over-iodized. Fixing with hypo would tend to prevent such an effect. If tripoli and dilute nitric acid do not remove the spots on your glasses, reject them at once. Yellow negatives are produced by intensifying weak negatives, first with bichloride of mercury, and then with a weak solution of iodide of potassium. The possession of such a process is a valuable adjunct, but we do not counsel its general use. The practice of adding silver to the developer from the bath is not a good one, as that is saturated with iodide of silver &c., and will aid in causing stains and pinholes. It is better to keep a weak solution for that purpose only. Carefully avoiding dust and muddy solutions will generally prevent pinholes. All the causes you name will cause the spots, and should all be avoided. Your prints indicate the necessity of a stronger silver bath, much deeper printing, and fixing in new hypo. The negatives might be more intense with advantage. Read the articles on "Photographic Chemicals" we are now publishing. We cannot tell you where to procure good albumenized paper. Unless you are skilled in the use of tools, we fear you will scarcely succeed in making either a binocular camera or carte de visite camera, and we cannot here give you a description of the best method of going about it. The best lenses for carte de visite portraits are those made expressly for the purpose. Quarter-plate lenses may be used for sitting figures, but for the standing figures a half plate lens should be used, unless you have a lens made for the purpose. The best dry process for India will be, we apprehend, the collodio-albumen.

A. R. W.—We do not at present know of any one who is in want of such a camera stand.

Pieric.—You will find particulars as to price, &c., of the spectroscope on our first page of advertisements. We are obliged by your complementary remarks. We shall be glad to receive a description of your tent

THE PHOTOGRAPHIC NEWS.

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INSTANTANEOUS PHOTOGRAPHS OF LONDON.

The term instantaneous photography is too often spoken of as if it were an absolute thing without any relation to time, place, or circumstance. Thus we hear of "instantaneous processes," "instantaneous collodion," "instantaneous dry plates," &c., without any reference to the other conditions necessary to instantaneity. What constitutes an instantaneous picture is not absolutely defined; in some instances an exposure of one second would be held to be instantaneous, and in others the tenth part of a second only would be required to produce a similar effect. In taking objects in motion, if the proofs are sharp and crisp without any blurring of the moving figure, the picture is held to be instantaneous. The rate of motion of the object, its direction across the field of vision, and the distance from the camera, are rarely considered, neither are the amount of actinism present nor the luminosity of the objects to be taken. If an instantaneous process were an absolute thing, then an express train, passing at the rate of fifty miles an hour, might unquestionably be photographed successfully, a feat which has not yet, we believe, been accomplished. The train passes over a space of about eight feet in the tenth part of a second, our readers may judge, therefore, the rapidity of the process necessary for securing a sharp image of an express train. Nevertheless, we have seen steamers at sea and clipper yachts before a smart breeze with all canvas spread, cutting the waters, perhaps, at a speed of twelve knots, or upwards, an hour, in which every line of cordage has been secured as sharp as if traced with a needle, waves with every crest of foam distinct, and flying clouds, without a blur. We were recently at the sea-side in company with Mr. Samuel Fry, who, in securing instantaneous marine effects, frequently found that the utmost possible rapidity of exposure, with an aperture of less than three-eighths of an inch, whilst giving perfectly instantaneous effects, in some cases produced over-exposure, such was the sensitiveness of the chemicals, the amount of actinism present, the luminosity of the objects, and the perfection of the lens. We may add, as a fact somewhat startling, that on one occasion that we—Mr. Hughes, Mr. Fry, and ourselves were present—secured fine effects of water, cliff, and sunset clouds at nearly nine o'clock on a July evening, with an exposure of ten seconds.

Instantaneous effects, in a city, present a new class of difficulties. Whilst the rate of motion is less rapid, it is more confused and varied; the objects are less luminous and the light is less actinic. Messrs. Ferrier and Soulier discovered this fact in producing their street scenes in Paris. If this were manifest in Paris, what must it be in London? The constancy and energy of the stream of moving figures, pedestrian, equestrian, and vehicular, and above all, the smoky, misty, non-actinic atmospheric conditions are well calculated to baffle the most ardent photographer.

Under these circumstances it is not surprizing that so few instantaneous views of London exist. We have recently received from Messrs. Dages and Harman, of Peckham, a score of specimens, of by far the best street scenes of London which have come under our notice. With a courage which is most praiseworthy, they have not shrunk from selecting many scenes presenting the greatest difficulties, where it has happened that they have at the same time possessed the most interest. Amongst these we may mention London Bridge Railway Terminus, with its crowds of cabs, omnibuses, and foot-passengers, London Bridge itself, similarly crowded, and the clock tower on the Surrey side. Charing-cross, the Strand, Fleet-street, Regent's-quadrant, and others, all present a similar scene of activity and bustle. In some of these it is quite easy to count upwards of fifty boldly-defined foreground figures, without mentioning those in the distance. There are also some very interesting river scenes on the Thames, with shipping and steamboats in full motion, &c.

It would be too much to say of these that they were all first-rate specimens of photography; but they are very good under the circumstances. The chief fault which strikes us—and we mention it because we feel assured that these artists having done so much are able to profit by the hint—appears to have arisen from some over-anxiety to obtain intensity. If we judge correctly, the negatives have been taken by some process requiring subsequent intensifying—probably by means of iodine, pyrogallic acid, and silver—and this has been carried slightly too far. The tendency in rapid processes is to the production of what Mr. Hughes has happily phrased a "phantom image." A negative with all the detail there, but so faint, so filmy, so transparent as to be little more than a phantom. To intensify such images at all, so as to secure printing qualities, requires some skill, and there is a great temptation to go too far, and so produce chalkiness. In these prints the distances, which at best in London are generally misty enough, appear obscured a little more than even the smoky atmosphere demands, by too long continued development or intensifying; the same process at the same time producing another defect—the white sky. But these drawbacks are not present in all, many of the pictures being surprisingly good photographs of such scenes.

The instantaneity is in many cases perfect. Here are omnibus horses with uplifted legs without a blur, and foot-passengers in every stage of action perfectly defined. Some few of the figures are not quite crisp and sharp, but this is chiefly where they have been defined with the extreme edge of the lens, rather than from want of rapidity in the exposure. Altogether they are very interesting, and, as we have said, the best instantaneous street views of London we have seen.

There is another hint we would throw out to these artists and others of our readers whom it may concern. The mounts of all photographs, and of stereographs in particular, should never be of a positive colour. The bright yellow of these mounts mars much of the effect. A warm grey, drab, or stone colour, in all cases as neutral and unobtrusive as possible, should be chosen, to secure the best effect.

THE FRENCH PHOTOGRAPHIC SOCIETY AND THE EXHIBITION OF 1862.

Some curious misapprehension seems to have existed amongst the members of the French Photographic Society when discussing the question concerning the proposed classification of photography in the forthcoming International Exhibition, to which their attention was called by the secretary of the London Society. Interpreting, apparently, Professor Playfair's letters in an authoritative sense, and regarding his strongly-expressed conviction that photography *must* be placed in its proper position, they are puzzled by the recommendations of Dr. Diamond's letter, which advise entire abstinence in contributing; and, as may be seen in the letter of our Paris correspondent, some of them are inclined to attribute sinister motives, and allow exploded notions of the supposed bad faith of "perfidious Albion," to take possession of their minds. The letter addressed, however, by M. Lauleric, the secretary of the society, to Dr. Diamond which we subjoin, is much to the purpose.

The letter is addressed in the name of the committee of the French Photographic Society, to the secretary of the London Photographic Society, and is as follows:—

"Sir,—I have the honour to inform you that the committee of administration and the general assembly have each met in succession to deliberate upon the grave communication which you have addressed to us in the name of the Photographic Society of London, on the subject of the forthcoming universal exhibition.

"The French Photographic Society is as much surprised as the London Society at the error committed in the programme of the Exhibition with respect to the classification of photography.

"It would only be necessary to visit one of our exhibitions to become convinced that photographs, at least such as have been produced with artistic feeling, are not mere mechanical products. For two artists, with the same apparatus, employed in the same conditions, will render the same portrait or the same view, not only in very different manners, but according to their individual feeling.

"Moreover, Dr. Playfair has himself demonstrated the error of classification in his letter, and with him, we do not doubt that the Royal Commission, if it can alter its arrangements, will be none the less disposed to practically rectify its theoretical error as far as possible.

"The French Photographic Society has doubtless the right and the duty to protest, with you, against the philosophical consequences of the error committed, since all its efforts, like your own, have tended to elevate photography to the dignity of an art; but, in participating the just indignation of the London Society, it cannot adopt the same conclusions.

"In the first place, our positions are not identical. You, as English exhibitors, can act directly upon the Royal Commission; but strangers, invited *as guests* to take part in the Exhibition, if they enjoy the undoubted right of not accepting the invitation, have no right to object to the conditions imposed. The Imperial Commission alone, doubtless, has an official character sufficient to state the observations of the French Exhibitors; and I must add that we have already received assurance of the liberal intentions of the Royal Commission with regard to photography.

"Furthermore, the General Assembly has unanimously recognised that in any case, even if the Royal Commission should consider itself unable to repair, as much as possible, the error committed (and we are well convinced of the contrary), *abstaining* will be the very worst mode of protesting. This abstaining would, in fact, have the effect of excluding true artists, whose works are the pride and honour of photography, and leave their place to be occupied by mechanics, whose detestable productions would, in the eyes of the public, fully justify the error of classification we deplore. We think, therefore, that so far from recommending the abstaining from exhibiting, Photographic societies should make a most pressing appeal to artists' worthy of the name, and be very severe in their selection of the works presented for exhibition. This exhibition, although in the midst of an Universal Exhibition, will undoubtedly, both by its interest and importance, be the most certain, useful, and worthy protest that can be made.

"The French Photographic Society, always animated with a vivid and sincere desire to maintain the happy union existing between itself and the Photographic Society of London; hoping that the latter, appreciating the conditions above stated, will neglect nothing to obtain in the execution the realization of the liberal intentions of the Royal Commission, the assurance of which has been given to us.

"On Friday next, the 19th inst., we shall have another general meeting, which will be the last before the vacation. The committee meet on Monday next. We have to request you to forward the communication we hope, sir, to receive from you, in time to arrive here on Monday, if possible, or at least before Friday."

Once more we take the opportunity of pressing upon the council of our society the importance of making the best of the offer of the Commissioners, and appointing a committee of good men to co-operate in securing justice to photography and photographers. That photographers, both at home and abroad, will exhibit, it is quite certain; the recommendation of the council to abstain, may impoverish the representation of the art, but cannot prevent it; whilst their co-operation and countenance may improve and elevate it. Surely it is better in some measure to guide, even if they cannot entirely control the issue. As the French secretary remarks, "abstaining will be the very worst mode of protesting." Those only might be expected to abstain whose artist's pride, or self-respect, was wounded; and theirs are the works, which in many instances, would most adorn and elevate Photography, whilst the absolute mechanics of the art would appear as its sole representatives, and justify, by their productions, the decisions of the Commissioners. Let it be rather the aim of photographers to prove, by the high character of their contributions, how blind was the judgment that placed them, in the first instance, in the same category as the hewers of wood and spinners of flax.

PHOTOGRAPHIC PATHOLOGY.

In another column will be found a letter from our esteemed correspondent, Mr. Francis J. Eliot, explaining some slight confusion of terminology which occured in a recent communication to our pages on "The Measles: its Diagnosis and Cure." As a contemporary, in an editorial notice, called attention to this a day or two ago, we think it right to state that Mr. Eliot's explanatory letter was forwarded for publication upwards of a week ago, but we were unable, for lack of space, to insert it in our last issue.

The suggestion of the term "measles," as designating a certain disease to which photographic prints are liable, was due to Mr. Hughes, and was undoubtedly intended to indicate the yellowish-brown spots arising from imperfect fixation. The mottled meally effect so common of late in albumenized prints, although certainly a cutaneous disease, is of an entirely different character, and proceeds from different causes. We commend Mr. Eliot's letter to the attention of our readers.

PHOTOGRAPHIC EXHIBITION AT MARSEILLES.

We have received from M. Vidal, secretary to the Photographic Society of Marseilles, a letter and prospectus of their intended Exhibition, to which he requests us to give publicity amongst English photographers. No effort appears to be spared in making this first Photographic Exhibition in the South of France as perfect and interesting as possible, both in photographs and photographic apparatus; in regard to the latter of which, the uses and modes of working, we are informed will be demonstrated to visitors. The opening is fixed for the first of September, and specimens and apparatus intended for exhibition will be received until the fifteenth of August. We subjoin an abstract of the principal regulations:—

1st.—The day for the opening of this Exhibition is fixed for the 1st of September, and it will continue open for a month.

2nd.—All communications and specimens are to be addressed, carriage free, to M. L. Vidal, secretary to the Society, until the 15th of August at the latest.

3rd.—They must be accompanied by a notice detailing the number of objects sent, and signed by the exhibitor.

4th.—The specimens exhibited must, if not mounted in an album, be enclosed under glass.

To avoid the expense and difficulties of transport, exhibitors who have not agents in Marseilles may have the privilege of addressing their proofs on paper to the secretary of the Society, who will take care that the proofs be put under glass, at the cost of the expositors, as economically as possible. In this case the communications should be forwarded not later than the 10th of August.

5th.—All proofs coloured, and all those which have been retouched so as to modify, in any essential degree, the photograph will not be admitted to the Exhibition.

6th.—All negatives on glass or on paper, on metallic plates, on stone or on wood, of which proofs are forwarded, will be received and exhibited with all necessary precautions, the same care shall be given to negatives sent to illustrate the apparatus, by which they have been obtained.

7th.—Exhibitors must inscribe their name on each proof or on the frame containing several proofs; they may also add their address, but they are requested to avoid further inscriptions.

8th.—The exhibitors of apparatus are invited to forward also their price lists, prospectuses, &c.

9th.—The subject of each picture and a summary of the process employed in producing the negative, whether wet or dry collodion, albumen, wax paper, &c., must in all cases be stated. All other information on the mode of operating will be valued.

10th.—The prices must not be indicated, neither on the proofs nor frames, nor on the apparatus exhibited.

11th.—The committee of management intend to buy a certain number of proofs for a lottery which will take place at the end of the Exhibition. The expositors, who intend to dispose of their proofs, are requested to mention the prices in their letter of advice to the secretary, who will communicate this information to the committee of management, and to the public. The same recommendation is made to the exhibitors of apparatus.

12th.—Specimens or apparatus exhibited cannot be withdrawn before the closing of the Exhibition.

13th.—The Photographic Society of Marseilles will have pleasure in receiving for a place in their archives all specimens which may be interesting as works of art, or as illustrating processes which contributors may be willing to place at their disposal.

14th.—All works intended for exhibition will be submitted to a jury of admission, selected from amongst the active members of the Society.

15th.—All objects exhibited will be returned at the expense of the expositors, within 15 days of the closing of the Exhibition. All letters to be addressed to the Secretary, No. 2, Rue Mazagran, Marseilles.

PHOTOGRAPHY IN THE UNITED STATES.

There are few things more interesting to ourselves than the glimpses we obtain from time to time of the progress of photography amongst our American brethren of the camera. Possibly pleasant personal recollections of some pleasant months' rambling about the States increase this interest. It is true that their journals are often very largely made up from the English photographic periodicals; but this is easily explained by the fact that there is a comparatively small amateur photographic public in America to communicate their experiences. There are few photographic societies and meetings to discuss things old and new appertaining to the art, and the conductors of the American photographic journals, therefore, wisely avail themselves of the interchange of ideas which is chronicled in this country. Their selections from our own pages and those of our contemporaries are frequently judicious, and generally acknowledged. We, in our turn, are enabled occasionally to give our readers the benefit of valuable practical papers from their pages. It must be acknowledged that at times their ideas are rather startling, and that they "leave the world behind" and "lose the beaten track" when they talk of producing twelve thousand prints an hour from one negative, and take bird's-eye views from balloons; use a mixture of "corrosive sublimate, tartaric acid, sal soda, and hydrochloric acid" instead of gold for toning, and "hard cyder and rusty nails" for developing. We now propose to make one or two extracts which will give our readers some idea of the collossal character which "Yankee notions" sometimes assume in connection with the commercial aspects of the art.

Mr. Fredricks, one of the principal photographers in New York, from whose atelier we have seen some magnificent portraits, and whose name may be remembered by our readers as the defendant in the long litigated bromide patents—of the termination of which by the way there has been no information—has recently opened an establishment for portraiture in Broadway on a scale which argues well for the state of the profession, despite the secession war; and will rather startle photographers in this country. *Humphrey's Journal* thus describes its dimensions :—

"The building is five stories high, 25 feet by 100 deep. The first story, front on Broadway, is a single arch, 30 feet high, covering a wide and very handsome vestibule, which opens immediately on the street, no intervention of doors separating it from the thoroughfare. This porch or vestibule presents in itself a fine collection of pictures, the sides being completely covered with elegantly-framed and finely-finished photographs of well-known local and other celebrities. The main gallery, or principal exhibition room, is on the street level, and is 20 feet high, 25 feet wide, and 100 feet deep; from this a wide staircase leads up to the second story, where are located the Ladies' Parlours and Toilette Rooms, which are fitted with every appliance desirable in such apartments.

"From the front of the principal parlour, which is fronted by a single large bay window, visitors can enjoy one of the finest views of the ever-varying panorama of Broadway that is to be found anywhere in the whole city. On the third floor is the principal operating-room, 50 feet by 25, its distinguishing feature being a hugh skylight, built in the form of an arch. This peculiar shape gives an opportunity for securing a strong light from any desired aspect, so that the weather is not permitted to make any difference in the excellence of the pictures. On this floor are also the rooms of the various artists in water colours and oil, whose labours are constantly in requisition in perfecting the highest works of photographic art.

"The fourth story is devoted to the Daguerreotype process. The fifth floor is reserved for printing. Mr. Fredricks employs thirty persons in the Broadway establishment, and so complete are the mechanical and artistic arrangements, that he estimates his facilities equal to the production of 180 negatives in a day.

"Every variety of photograph and Daguerreotype is made by Mr. Fredricks, the scale of prices running from one dollar, asked for a miniature plain photograph, to 600 dollars,* the regal price demanded for an imperial, life-size, full-length photographic portrait, finished in oil-colours by a first-class artist."

The *American Journal of Photography* describes the same building, and speaks thus of the vestibule :—

"The doorway is gracefully built as an arch, the keystone of which is nearly thirty feet from the pavement, and forms the entrance of a vestibule of the same height and width, and about twenty-five feet deep. The vestibule is ornamented and furnished in the most artistic and useful style. Its most striking features are a gallery for promenade, resting place, or sight-seeing on Broadway, and a large chandelier at the ceiling provided with mirrors which reflect the light down to every part of the whole space. The vestibule opens into the grand exhibition room, where the largest collection of photographs ever made greets the eye. The hanging of the pictures, and the management of the light (two rows of gas jets the whole length of the ceiling), forcibly remind one of the exhibitions of the old Art Union."

It is quite clear from the enterprize Mr. Fredricks exhibits that he does not regard the palmy days of photography as past, as we have heard more than one professional photographer in this country intimate.

We give another illustration pointing in the same direction, and at once showing the extensive notions of brother Jonathan and the extensive demands which create them. A recent number of the *American Journal of Photography* contained a small photographic portrait of Col. Ellsworth, on albumenized paper, about half an inch square. It appeared to be a reproduction either from an engraving or a photograph which had been touched up by the artist. It was accompanied by a paragraph to this effect :—"We present a sample of a photograph on albumenized paper, which may be printed by a single person at the rate of *fifty-thousand an hour*. Our guessing friends will please find out

* One dollar is 4s. 2d., and 600 equal to £125.

how such an astonishing feat can be performed; it is a fair problem and there is no trick about it." The last-issued number of the same journal gives a variety of solutions of the problem, from which we give some extracts. Mr. Simon Wing, of Waterfield, Maine, says:—

"My machine (patented) has four ¼-tubes,* and carries a plate 12×15 inches. Now we can use about 11×14 inches of said plate, and have a half inch all around it, to handle it by. Now these little prints being ½ inch square, we can get on to our plate of 11×14, 616 negatives, and by making four at a pop or more, and moving once in two seconds, it gives us one negative in one-half second, so we have our negatives in about five minutes; now we will run about ten plates through the machine, which will be enough for one to tend. Now one man can print one print from each in about two minutes, which will make thirty in an hour; so if we multiply thirty by the ten plates, making 300, and then multiplying 616 by 300, we shall have 184,000, which is more than three times what we are asked for, so we will tell how it is done and no one need guess again.

"First, we use four tubes, each tube being set in front of a quarter of the 11×14 plate, and four square ½ inch apertures through a plain board are placed between the tubes and the plate, so as to expose only enough of the plate to make four impressions, one for each tube; now move the plate one half inch either way and expose again, and so on till the plate is all covered.

"Our machines are simple and cheap considering their advantages over all other machines for the purpose, as we can use the same machine for every kind of work for which a camera is used, copying, stereoscoping, ambrotyping, &c., and using the common size plates; so the operator has not to buy a new bath, printing boards, &c., &c. The small size will make eighty little pictures on ¼ size plate, one half inch square like Colonel Ellsworth's, or the entire plate can be exposed at once and make a ½ size Daguerreotype, or ambrotype, or negative, or take either of the smaller-size plates and multiply on them, so the multitude can be accommodated with few or many, and melainotype plates, or niello paper can be used to great advantage by those who do not make photographs, and are more profitable to the operator and pleasing to the customer."

Another correspondent writes from Boston to the following effect:—

"I do not think it requires a very high order of guessing ability to determine how such photographs as that of Colonel Ellsworth may be readily and rapidly produced. I would think it strange if our skilful photographers generally would refuse a profitable order for work of that kind, from lack of inventive talent to execute it.

"It seems to me evident that the problem resolves itself into the various ways of multiplying a single image on the glass for the compound negative. One image only on a single glass cannot be made to yield 50,000 images in an hour, at least in the present state of our art; Fontayne's machine is *said* to have been worked at the rate of 12,000 in an hour, but has not produced anything of first-class photography.

"Now I would suggest that the compound negative may be produced by using a multiplying glass directly in front or behind the lens of the camera. Or the image may be multiplied by means of a multiplying mirror. In this way the compound negative would be made directly from the object, giving as many images as there are faces on the multiplying glass.

"I seriously hint that this idea is worth putting into pracpractice, and especially for card pictures. There can be no serious difficulty in making a multiplying glass of four or six faces of proper angles, and achromatised, if necessary, which would give at one sitting four or six figures, card size, with a single quarter tube. Of course, the time will be increased as much as the light is divided."

And finally Jonathan Slick writes from somewhere in Connecticutt:—

"Mr. Eddytur.—As I was sleepin' the other night very soundly except for the skeeters I heerd a great sound, like a fife, that made me start up on eend and think a biler had bust. But Polly Slick (that's my wife) had been awake, and was not at all afeerd I asked her if anything had broke loos', and she sed, 'it was only that tarnal crazy critter Jonathan.' (Jonathan is our youngest offspring.) 'Ever sens he's took to ambertipes and foetograffy, he acts like a darned fool. He's all the time talkin' about assids and oxhides and all kinds of pisen, and he gets his hands as black as an injen, and he's spilin' everything in the house with his baths and sensitizin licker. It's too bad and you must put a stop to it or there wunt be anythiug fit to be seen. Now he is cantankeratin in the night, and disturbin' all the nabers with his screechin. What do you spose he means by hollerin out "I kin dew it, I kin dew it"?' Was that what he sed, sez I, wakin up agin? You see, Mr. Eddytur, my wife's sientific edication was never anything to brag on, and she had never read about them sellybrated wurds of Arkimeedis, or she wud a none that our boy had diskivered something.

"Next mornin' Jonathan kep pritty scarce from his mother, and went a tinkerin in his room over the woodshed, which he calls his labritory.

"When he cum to dinner, he brung a basin heepin full of little picters of his mother and of the present riter. 'Goodness grashus! what on airth!' sez my wife. But she was kinder pleezed, and she didn't say a wurd about disturbin' fokes in the night.

"After dinner we all went out into the labritory and Jonathan show'd all how he did it. Up agin the wall he stuck about 2 duzzen hull size foetograffs of his parents; then he pinted his kamery and took 'em more'n twenty times. He said he was projucin negitives with about 500 figgers in each. Well, pretty soon we had the foetograffs on a sheet of paper.

"Now, of course, you know the little detales and prosesses, and I have rote enuff to show the natur of my boy's diskivery.

"Jonathan calkilates he kin make about 500,000 foetograffs in an hour if he was put tew it.—Respectfully for Sience,

Jonathan Slick.

"P.S.—The next time Jonathan goes down tu York with the slupe he will call on yure offis."

Our readers may possibly gain some glimpses of light from the "gas," which accompanies brother Jonathan's "guesses."

* The term "tube" is used for a lens.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Hydrobromic Acid.—This acid is of similar composition to the one last described, and is of considerable use in photography. The popular way of preparing hydrobromic acid, by adding bromine to alcohol, is a most imperfect and unsatisfactory mode, as an addition to the hydrobromic acid. there is produced a considerable quantity of bromal, together with aldehyd, and acetic acid. Bromal is a colourless, oily-looking fluid, of a peculiar irritating odour, producing a flow of tears. It is considerably volaitle, and for several reasons should be kept out of photographic preparations.

The ordinary way of preparing hydrobromic acid in the pure state is to distil a mixture of water, bromine, and phosphorus. The operation requires conducting with considerable care, as the reaction between the phosphorus and bromine is attended with such violence, that explosions frequently occur. The safest plan is to keep the retort cool with ice, and having put in the water and phosphorus, to add very gradually, through a funnel-tube, the bromine. When the portion first added is decolourized, a further addition may be made, and so on until the whole quantities have been mixed together, when the liquid may be distilled. In this process 12·5 parts of bromine are taken to one part of phosphorus. The liquid which distils over, if colourless, is pure aqueous hydrobromic acid, but if it be coloured it contains bromine, which may be removed by agitation with mercury, and redistilling. It would be a great improvement on this process, if amorphous, instead of ordinary phosphorus were employed. This red variety of phosphorus, which is now become an article of commerce, acts in the same manner as the ordinary kind. but its reactions are less intense. Even when this is used the bromine must only be added gradually, as the reaction is very energetic. The subsequent distillation and purification must be conducted as previously described.

By far the best as well as the safest plan for preparing hydrobromic acid is to distil a mixture of bromide of potassium and phosphoric acid. A retort should be fitted with a cork at its extremity, and a tube sloping upward (as also should the retort itself), and so bent that the gaseous acid which is evolved may pass through a bottle of distilled water. In the retort are placed some dry powdered crystals of pure bromide of potassium, and over this is to be poured a concentrated solution of phosphoric acid. Heat is now applied when the gaseous hydrobromic acid comes over in great abundance, and is rapidly condensed in the water through which it passes. The resulting solution forms a colourless, strongly acid, fuming liquid of considerable density. In its most concentrated form it has a specific gravity of 1·29. A very strong acid, when boiled becomes weaker, whilst a weak acid becomes stronger on boiling; the ultimate produce of boiling hydrobromic acid of any strength being the same. An acid of this strength has a specific gravity of 1·486, and contains about 47 per cent. of the anhydrous acid, being represented symbolically by the formula HBr, 10HO. It boils at 259 F., and may, of course, be distilled unchanged.

The impurities likely to be present in commercial hydrobromic acid, are phosphorous, hydrochloric acid, sulphur compounds, free bromine, and organic compounds. The *phosphorous* may arise from insufficient purification. It is best detected by adding an equal volume of nitric acid to the suspected acid, and, after boiling together for a few minutes, to evaporate to dryness at a gentle heat. If phosphuretted compounds had been present, the nitric acid would have oxidised them into phosphoric acid, which would be left behind as a colourless syrupy mass on evaporation. This residue when dissolved in water should be tested for acidity by means of blue litmus paper. If it be acid, ammonia in excess should be added to it, then a drop of sulphate of magnesia solution, when a white crystalline precipitate shows the presence of phosphoric acid. *Hydrochloric acid.*—This impurity may be present owing to the bromine not having been properly purified from the chlorine used in its separation. It can only be detected by a difficult and rather complicated chemical process quite beyond the powers of any one but an experienced chemist to perform. This part of our subject would not, however, be complete were the process to be omitted, and we therefore give it for the benefit of our chemical readers. The acid is to be first neutralized with carbonate of soda and then evaporated to dryness. The dry white residue is then to be mixed with an equal bulk of bichromate of potassa, and well powdered together. The mixture must now be placed in a perfectly dry test tube to which is fitted a cork and bent glass tube, which leads to another perfectly dry tube surrounded with cold water. Oil of vitriol is then to be added to the mixture in the first test tube and heat applied by means of a spirit lamp. Dark red vapours will be evolved which will pass through the bent glass tube, and condense in the dry test tube in the form of a dark red liquid. This liquid consists of bromine, and (if hydrochloric acid has been also present) of chloro-chromic acid. Water is now to be added to the liquid and then excess of ammonia. The bromine will be dissolved in the alkali with formation of a colourless liquid, but chlorochromic acid will be decomposed and dissolved forming a *yellow* solution. If therefore the liquid after addition of ammonia be of a yellow colour, it is proof that chlorine is present. The *sulphur compounds* may be present if the hydrobromic acid has been prepared by a method which is sometimes adopted, namely by passing hydrosulphuric acid through a mixture of bromine and water. This is a bad method and should never be used, as, however, it is attended with no great difficulty, it is sometimes employed, and consequently commercial acid should always be tested for this injurious body, sulphur, unless the respectability of the maker of the acid is sufficient guarantee that proper means of preparation have been adopted. Add nitric acid to the suspected acid, and boil for some time, as in the case of the phosphoric acid, then add a drop or two of chloride of barium and dilute the liquid with three times its volume of distilled water. If there is a permanent white precipitate, it will be sulphate of baryta and will show that sulphur has been present in the hydrobromic acid. *Free bromine* has already been alluded to as likely to be present from the volatilisation of the bromine used in the preparation of the acid. It may readily be removed by shaking with metallic mercury, or by adding a slight trace of soda or potash and redistilling. Its presence may also be at once seen by the orange red colour which it communicates to the acid. If the presence of the bromine were only caused by the volatilisation of this element in the process making, it would not be an impurity of much consequence; but pure hydrobromic acid itself gradually absorbs oxygen from the atmosphere, and liberates bromine, and this being constantly removed by mercury or alkali gradually weakens the acid until scarcely anything is left but pure water. *Organic compounds* may also be present in commercial hydrobromic acid if it is prepared, as is sometimes the case, by the action of bromine on alcohol. These have a peculiar, and, in some cases, a very powerful smell. In the ordinary state they would not, however, be detected by this test, as their odour would be marked by that of the acid. The latter must, therefore, be neutralised by the cautious addition of caustic potassa, care being taken to avoid a great excess, when the peculiar odour of the organic products will be at once apparent.

COLLODION MUST BE ACID AND CONTAIN FREE IODINE.

It is assumed by most photographers that collodion to act quickly must be, as much as possible, exempt from acid and free iodine; nevertheless, all collodions which act well are both acid and coloured by free iodine.

Acid in excess in the nitrate of silver bath, in the collodion, and in the developing agent, is the cause of the pictures being formed very slowly, and for this reason also the total absence of a picture sometimes occurs; in this case the collodion is intact, and retains its beautiful opaline colour. Excess of acid is, therefore, injurious; but to insure success, and also to obtain the maximum rapidity, a certain amount of acid must be present in the silver bath, in the collodion, and in the reducing agent, besides free iodine in the collodion.

I have recently had occasion to prove the necessity for this. Having undertaken a research upon sulphate of iron-developing agents. I passed a whole day without being able to obtain the slightest trace of an image, as the picture became suddenly fogged, and, after washing with hyposulphite, presented a bright metallic appearance. I really did not know what to do. I even looked through my lens into the camera, to see if the light found admission anywhere. As my silver bath was the same as I had employed the day before, and with the same collodion, had given good pictures with any kind of preparation of sulphate of iron for developer, I was induced to believe that the evil arise from the new preparations of sulphate of iron, which I had varied in every possible manner. I had them red, yellow, green, and brown, which I acidulated more and more. At last, I recollected that I had added some fresh normal collodion to that which I had used the previous day, with the view of rendering it thicker. I was very far from supposing that this had anything to do with my failures; but in making use of some collodion to which no addition of normal collodion had been made, all my sulphates gave good pictures, and the rebellious collodion, after being mixed with a *red* collodion, very slow of itself, gave good proofs with the same sulphates.

Thus, there is sometimes formed in normal collodion, a reducing compound, such as aldehyde, formic acid, &c., which must be neutralized by the addition of an *acid*, or of *iodine in excess*. The addition of an acid does not always turn the collodion red; crystallizable acetic acid for example does not redden collodion even after several days, and added in very small quantities, one or two drops to the ounce of collodion, is an excellent means of preventing fogged pictures.

The addition of iodine produces the same effect, but the dose must be a minimum one. Generally, good collodion has a lemon colour when in small bottles, but which becomes orange when in large bottles; and if we drop a little collodion that works well upon a piece of test paper, it will always be found to show an acid reaction.

The nitrate of silver bath must also be acid, especially when employing iron developers. It has been almost impossible to obtain anything passable with a silver solution neutral to test paper; but upon adding one or two drops of nitric acid, sufficient to redden the test-paper, all went well, and better still when the collodion contained acetic acid.

Therefore, reducing agents must be banished from collodion as well as from the nitrate bath. This fact naturally brings me to M. Ferrier's case, in which he announced to the Paris Photographic Society, that he obtained his instantaneous views through the addition of formic acid to the nitrate of silver-bath. After satisfying myself by numerous experiments that the addition of formic acid to the nitrate bath is always followed by a general fogging of the plate, and the complete absence of a picture, and being persuaded that M. Ferrier knew that fact as well as I did myself, I oudly protested against his statement. If the formic acid be added to the reducing agent, and not to the nitrate bath, the condition of things is entirely changed.* M. Ferrier says that the error of statement was a misprint; if it were so, he ought immediately to have announced it through the journals, and not led a host of experimental photographers into a course of profitless trials. As for myself, I was greatly irritated at having been led through his error or mis-statement, into spoiling my baths, and expressed my feelings rather strongly. It is more than probable that M. Ferrier never put formic acid into his silver solution.—*La Lumière.*

GLYCERINE IN COLLODION.

BY M. A. GAUDIN.

Photography, so long as it is confined to obtaining very pure negatives upon wet collodion, if we disregard sensibility, presents no difficulty; but from the moment we wish to obtain the greatest sensibility, the task becomes difficult. For a good, rapidly-obtained negative to become suddenly *fogged*, is no unfrequent occurrence, without our being able to trace the cause of it. This kind of failure is not peculiar to photography. All the perfected arts require similar delicate precautions, that is to say, an operation of great complexity, the knowledge of which has been obtained by multiplied researches. A simple touch of the painter's pencil on a picture, although appearing the simplest thing in the world, is really a very complex operation. It requires that the painter first prepares the proper hue of colour, to which end he must select the proper pigments, and mix them, not by weight, but by the eye, according to his judgment. For the application of the touch, the difficulty is as great; it must occupy a precise spot, which cannot be measured by the compass, but rather by the artistic feeling of the painter, who takes into consideration the effect of the slightest touch upon the general effect of the pictures. So, also, in photography; all the agents employed are allied and dependent upon each other; it is necessary that the same harmony exists between them as between the touches in a painting; and often, a single drop of a substance suffices to destroy the equilibrium when we are on the eve of perfection, as in the picture of a master, the least discordant touch becomes a spot.

By analogy also, there exists an infinity of possible combinations between the chemical agents of photography, as between the colours used by the painter, consequently, this subject will never become exhausted.

For example, after having employed glycerine in the the silver bath with some success, I was naturally prompted to try its effects when added to collodion and to the reducing agent. In adding it to the collodion, I had in view the increasing the porosity of the latter, but I hesitated to employ it, supposing that it would act like *water*, by destroying the cohesion of the collodion. Experience has furnished a decidedly opposite result, for I have been able easily to transfer to paper an ordinary collodion to which glycerine has been added. Glycerine may be added to collodion in the proportion of five per cent., without impairing its qualities, while it singularly facilitates its filtration through paper. This collodion, recently mixed with glycerine, yields pictures of unexceptional purity, without any apparent diminution of sensibility, *on the same day* they are mixed, but I strongly suspect that the collodion becomes very slow on the morrow, for, upon two trials, I have been so satisfied with the addition of glycerine that I mixed it with all my collodions; but next day, I remarked that they acted much slower, which could proceed from no other cause. I propose to clear the question by dividing a bottle of collodion into two equal portions, and adding 5 per cent. of glycerine to one, and operating with both, side by side, on the same plate, on the same day, and on the morrow.—*La Lumière.*

* Our readers, on looking back, will find that the announcement in our pages stated that the formic acid should be added to the developer.—Ed.

Photographic Tourist.

MY FIRST PHOTOGRAPHIC TOUR.

If, under the head of "Photographic Tourist," the following brief narrative of my first experiment in that direction may legitimately claim space, you are heartily welcome to these pages. They go a little out of the usual track, but they may not be altogether uninteresting to your readers, who perhaps may even appreciate their novelty.

I may as well begin by confessing how in the year —48 I emerged from a state of apprenticeship and began to "look around and choose my ground," in order to start in life and win bread as one of the smaller fry of street-exhibiting miniature painters. How I took apartments in a leading London thoroughfare,—hung out at the street door a small mahogany case containing a few elaborately stippled water-colour sketches and ivory miniatures—and how, I being a poor, *lonely*, friendless fellow of nineteen, my next *prudent* step was to *get married!*

Well, every miniature painter can tell you how that must have ended. Our brother painter, Daguerre, had doomed us to destruction. Bill and Tom, and Bob and Jack, came from bench, and shop, and desk, leagued photographically for our extermination. Charming little homes, on first and second floors, where the refining and beauty-creating power of soul-bewitching art brought humble means but pleasant cheerfulness to its lowliest votaries, were broken up, or became miserable dungeons, in which shabbiness of garments locked-up poor wretches, trembling at the steps of cash-demanding landlords and merciless duns; in which poor wives bravely restrained their own bitter tears the better to wipe away those from the eyes of their (at least at such times commonly) weaker, if not "worser," halves; and in which poor little children grew accustomed to going supperless to bed. Ours was not, perhaps, the worst of such cases—for we had no children—but, egad, I thought it bad enough: and many a time did I and my poor little dearie—a mere boy and girl—look tearfully along our future path into that narrow black tunnel as it went tapering away into the far distance to a spark of light which, indicating the way out, we fondly called "*some* hope;" without which—Ah, well! that's all over now, and has no right to be here recalled.

There was only one way out of the mess we, poor young loving fools, were in. We took it—that is to say, we did sell everything we had of any value, and we did'nt pay the rent of three quarters of a year, for which, by the by, I had already been summoned—and by so doing we were enabled, that is to say I, as representing both, to visit a certain photographer, receive lessons in photography, and get him to procure us the necessary apparatus.

This photographer was not exactly a first-class one, but such as he was his charges were more within the scope of our paltry means. (I afterwards understood that, previous to the introduction of the daguerreotype, he flourished cross-legged on a tailor's shop-board). He was a small, thin-faced man, with a large moustache and a rough head of long, straight hair. There was an air of no small consequence about him, when I called upon him, and, though he appeared in a scarlet smoking cap, and an elaborately-braided velvet morning coat, his speech at once betrayed that his education had *not* been conducted at either of our Universities. In his way of doing business there was, I found, much of the Jew salesman blended with an exaggerated, ludicrous, and caricatured imitation of the artists' pride, and such a strong dash of the loftily wonderful, mysterious, and magical, as an alchymist who had discovered the philosopher's stone, and was not going to part with it for any trifling considerations, might have displayed.

When I first saw him develop the image over the mercury I was curious to understand the theory of this process.

"Blest if I know," said this great Israelitish-wizard-artist being. "All that I knows about it is, that when I put this 'ere plate in that there place, somehows or another it brings out the pictur'."

Such a very lucid explanation wasn't *quite* satisfactory; but, perhaps, it would not be so very difficult, even now, to point out not a few photographers whose ideas—despite the efforts of journals and societies—are in a similar indefinite condition as to the rationale of their art.

So I received my lessons, mastered the laborious mysteries of rouge and tripoli in cleaning and polishing, or buffing the plates; learnt how the same were to be iodized and bromined; how they were to be exposed, and how, by the aid of a spirit-lamp and the mercury-box, I could "bring out the pictur'," which knowledge cost me, I think, £20.

When all these tremendous secrets, so guardedly and jealously shielded from less-privileged beings, were in my possession, I got my worthy instructor to procure me the cheapest possible set of useful apparatus, a wish of mine which he most religiously observed, for I doubt if a cheaper (or more worthless) set could have been found in the shop of any dealer in such goods. Although the spirit of my wish was certainly somewhat lost sight of in his charging me for this same apparatus, just as much as would have purchased a first-rate set of a first-class dealer. I, however, paid my money cheerfully, and readily enough (although it was just a little less than all I had), for did not my talented instructor ostentatiously parade the generous nobility of his artist-like nature, by repeatedly calling my attention to the dealer's receipt, for the cash paid, as a proof of the absurd trifle he got, by way of per centage, in purchasing and making choice of the same, at the expense of so very much of his most precious time, and such very great trouble.

Not long ago I was talking over this affair with this very identical dealer.

"Oh, the cunning rogue," said he, "I thought that was why he used to induce me to give receipts for more money than he paid for articles, ha! ha! ha! ha!"

As he spoke thus, and laughed aloud, I thought gravely of my poor wife, and of our hard, hard struggles in consequence of the above robbery, and was sorely tempted to give this dealer, as some folk say, "a bit of my mind," but I did not, although I have never since visited his shop.

And thus, then, did I prepare to start upon my first photographic tour. I must confess that I did not take kindly to the new art-science, for all my more ardent aspirations pointed the artist painter's way, and it cost me no small effort to resign the earliest love of my heart and lay down the palette, pencil, and brush, for metal plates and chemicals.

I had worked hard and perseveringly, and in the face of more obstacles than I can here describe, to acquire the profession, which thus failed me in my sorest need. I used to go to my master's studio at 8 in the morning, and leave at the same hour in the evening, to hurry to my not particularly elegant or stylish home (one room in the back of a narrow back street's house), and get to my pencils and desk. Copying from prints or paintings, or from the round; and, when I could afford a model, from the nude. I went in ambitiously for all branches of artistic study, including anatomy—that is to say, so far as I could from the few books, &c.* I contrived to borrow, and I used to sit up night after night until the eager and absorbing interest of my work gave way to the sensation of fatigue, and I could jump into my bed and a sound dreamless slumber at one and the same time. So you must confess I had some excuse for the sad feelings I experienced in deserting the darling profession I had so earnestly and lovingly prepared myself for, and turning all my energies and efforts into a fresh and uncongenial channel.

To return. We made up our minds to start on our tour through the eastern counties, as "photographic artists," and we had circulars duly prepared, stating that Mr. and Mrs. S— from ——, London, informed "the nobility, gentry, and inhabitants of Chelmsford," &c., &c., with a few poetical lines about securing "the shadow ere the substance fade," &c., quoted, doubtless, from some eminent poetic authority, together with a list of prices, and having completed the packing of our boxes one eventful night, we sat up, talking cheerfully and hopefully of the future until morning broke, lest we should be too late for the earliest train. We chose Chelmsford for our first starting point, for this very sufficient reason, it was not far, and we could land there with at least one bright-eyed sovereign in our possession, upon which we knew a longer journey would have made very serious inroads.

R. A. S.

SUN-PAINTING AND SUN-SCULPTURE.

BY OLIVER WENDELL HOLMES.

There is one old fable which Lord Bacon, in his "Wisdom of the Ancients," has not interpreted. This is the flaying of Marsyas by Apollo. Everybody remembers the accepted version of it, namely,—that the young shepherd found Minerva's flute, and was rash enough to enter into a musical contest with the God of Music. He was vanquished, of course, and the story is, that the victor fastened him to a tree and flayed him alive.

But the God of Song was also the God of Light, and a moment's reflection reveals the true significance of this seemingly barbarous story. Apollo was pleased with his young rival, fixed him in position against an iron rest (the *tree* of the fable), and took a *photograph*, a sun-picture of him. This thin film or *skin* of light and shade was absurdly interpreted as being the *cutus*, or untanned leather integument of the young shepherd. The human discovery of the art of photography enables us to rectify the error and restore that important article of clothing to the youth, as well as to vindicate the character of Apollo. There is one spot less upon the sun since the theft from heaven of Prometheus Daguerre and his fellow-adventurers has enabled us to understand the ancient legend.

We are now flaying our friends and submitting to be flayed ourselves every few years, or months, or days, by the aid of the trenchant sunbeam which performed the process for Marsyas. All the world has to submit to it—kings and queens with the rest. The monuments of Art and the face of Nature herself are treated in the same way. We lift an impalpable scale from the surface of the Pyramids. We slip off from the dome of St. Peter's that other imponderable dome which fitted it so closely that it betrays every

* South Kensington Museum was then, alas! not in existence.

scratch on the original. We skim off a thin, dry cuticle from the rapids of Niagara, and lay it on our unmoistened paper without breaking a bubble or losing a speck of foam. We steal a landscape from its lawful owners, and defy the charge of dishonesty. We skin the flints by the wayside, and nobody accuses us of meanness.

These miracles are being worked all around us so easily and so cheaply that most people have ceased to think of them as marvels. There is a photographer established in every considerable village,—nay, one may not unfrequently see a photographic *ambulance* standing at the wayside upon some vacant lot where it can squat unchallenged in the midst of burdock and plantain and apple-Peru, or making a long halt in the middle of a common by special permission of the "Selectmen."

We must not forget the inestimable preciousness of the new Promethean gifts because they have become familiar. Think first of the previlege we now have of preserving the lineaments and looks of those dear to us.

"Blest be the Art which can immortalize,"

said Cowper. But remember how few painted portraits really give their subjects. Recollect those wandering Thug of Art whose murderous doings with the brush used frequently to involve whole families; who passed from one country tavern to another eating and painting their way—feeding a week upon the landlord, another week upon the landlady, and two or three days apiece upon the children; as the walls of those hospitable edifices too frequently testify even to the present day. Then see what faithful memorials of those whom we love and would remember are put into our hands by the new art, with the most trifling expenditure of time and money.

This new art is old enough already to have given us the portraits of infants who are now growing into adolescence. By-and-by it will show every aspect of life in the same individual, from the earliest week to the last year of senility. We are beginning to see what it will reveal. Children grow into beauty and out of it. The first line in the forehead, the first streak in the hair are chronicled without malice, but without extenuation. The footprints of thought, of passion, of purpose, are treasured in these fossillized shadows. Family traits show themselves in early infancy, die out, and reappear. Flitting moods, which have escaped one pencil of sunbeams, are caught by another. Each new picture gives us a new aspect of our friend; we find he had not one face, but many.

It is hardly too much to say, that those whom we love no longer, leave us in dying, as they did of old. They remain with us just as they appeared in life; they look down upon us from our walls; they lay upon our tables; they rest upon our bosoms; nay, if we will, we may wear their portraits, like signet-rings, upon our fingers. Our own eyes lose the images pictured on them. Parents sometimes forget the image of their own children in a separation of a year or two. But the unfading artificial retina, which has looked upon them, retains their impress, and a fresh sunbeam lays this on the living nerve as if it were radiated from the breathing shape. How these shadows last, and how their originals fade away!

What is true of the faces of our friends is still more true of the places we have seen and loved. No picture produces an impression on the imagination to compare with a photographic transcript of the home of our childhood, or any scene with which we have been long familiar. The very point which the artist omits, in his effort to produce general effect, may be exactly the one that individualizes the place most strongly to our memory. There, for instance, is a photographic view of our own birthplace, and with it a part of our good old neighbour's dwelling. An artist would hardly have noticed a slender, dry, leafless stalk which traces a faint line, as you may see, along the front of our neighbour's house next the corner. That would be nothing to him, but to us it marks the stem of the *honeysuckle-vine*, which we remember, with its pink and white heavy-scented blossoms, as long as we remember the stars in heaven.

To this charm of fidelity in the minutest details the stereoscope adds its astonishing illusion of solidity, and thus completes the effect which so entrances the imagination. Perhaps there is also some half-magnetic effect in the fixing of the eyes on the twin pictures,—something like Mr. Braid's *hypnotism*, of which many of readers have doubtless heard. At least the shutting out of surrounding objects, and the concentration of the whole attention, which is a consequence of this, produce a dream-like exaltation of the faculties, a kind of clairvoyance, in which we seem to leave the body behind us and sail away into one strange scene after another, like disembodied spirits.

"Ah, yes," some unimaginative reader may say; "but "but there is no colour and no motion in these pictures you think so life-like; and at best they are but petty miniatures of the objects we see in Nature."

But colour is, after all, a very secondary quality as compared with form. We like a good crayon portrait better for the most part in black and white than in tints of pink and blue and brown. Mr. Gibson has never succeeded in making the world like his flesh-coloured statues. The colour of a landscape varies perpetually with the season, with the hour of the day, with the weather, and as seen by sunlight or moonlight; yet our home stirs us with its old associations, seen in any and every light.

As to motion, though, of course, it is not present in stereoscopic pictures, except in those toy-contrivances which have been lately introduced, yet it is wonderful to see how nearly the effect of motion is produced by the slight difference of light on the water, or on the leaves of trees as seen by the two eyes in the double picture.

And lastly, with respect to size, the illusion is on the part of those who suppose that the eye, unaided ever sees anything but miniatures of objects. Here is a new experiment to convince those who have not reflected on the subject that the stereoscope shows us objects of their natural size.

We had a stereoscopic view taken by Mr. Soule, out of our parlour window, overlooking the town of Cambridge, with the river and the bridge in the foreground. Now, placing this view in the stereoscope, and looking with the left eye at the right stereographic picture, while the right eye looked at the natural landscape, through the window where the view was taken, it was not difficult so to adjust the photographic and real views that one overlapped the other, and then it was shown that the two almost exactly coincided in all their dimensions.

Another point in which the stereograph differs from every other delineation is in the character of its evidence.

A simple photographic picture may be tampered with. A lady's portrait has been known to come out of the finishing artist's room ten years younger than when it left the camera. But try to mend a stereograph, and you will soon find the difference. Your marks and patches float above the picture and never identify themselves with it. We had occasion to put a little cross on the pavement of a double photograph of Canterbury Cathedral, copying another stereoscopic picture where it was thus marked. By careful management the two crosses were made perfectly to coincide in the field of vision, but the image seemed suspended above the pavement, and did not absolutely designate any one stone, as it would have done if it had been a part of the original picture. The impossibility of the stereograph's perjuring itself is a curious illustration of the law of evidence. "At the mouth of *two witnesses*, or of three, shall he that is worthy of death be put to death; but at the mouth of one he shall not be put to death." No woman may be declared youthful on the strength of a single photograph; but if the stereoscopic twins say she is young, let her be so acknowledged in the high court of chancery of the God of Love.—*Atlantic Monthly.*

GUN-COTTON FOR COLLODION.

BY COLEMAN SELLERS.*

That wonderful property possessed by cotton, in common with other vegetable fibres, of being converted by acids into a substance soluble in ether and alcohol, makes it invaluable to the photographer; but, to judge by the amount of writing on the subject from the pens of so many able chemists, there must be great uncertainty in its preparation to make it fit for our use. Few authors venture to give a fixed formula for its manufacture, and few amateurs, reading of the many difficulties and dangers, venture on experiments. For my own part, after a few trials, I was well content to purchase what I should need from reliable chemists, and have generally been well satisfied with its working. There has always, however, been a desire on my part to try it again, on certain conditions, and the principal one was, that I should have the cotton thoroughly bleached. Here was the great trouble, and my want of knowledge in the bleaching line prevented my attempting this part of the experiment. I had seen cotton boiled in alkalies, and then well washed and dried; but still it did not become the pure article I wanted as the ground-work.

Chance, however, brought me in contact with one who could supply this want. Mr. J. Hunter, whose extensive bleaching works near Philadelphia, evince his thorough knowledge of the art—becoming interested and rapidly proficient in photography, entered at once into the spirit of my experiments, and volunteered to furnish the cotton, which he treated thus:—Having selected the best article of cotton he could find, he took it as it came from the cards, as clean as machinery could make it. He then quilted it in between two muslin cloths about one yard square. These quilts were then put into the bleacher's hands, and were nearly a week undergoing the various processes. When they reached me, nothing could be whiter or purer than the cotton seemed to be, its characteristic peculiarity being a wonderful capacity for absorbing moisture. If a bunch of it was held so as to touch the surface of water, the fluid would at once rise into the mass by capillary attraction, in great contrast to the action of raw cotton under similar circumstances, which will repel water like a duck's back.† It was so hard and crisp that it would not have been possible to re-card it. Hence it had a more matted look than raw cotton usually has, but was easily picked apart with the fingers.

Allow me here to remark, that it at once occured to me that there were many uses to which this cotton could be put to besides making gun-cotton, as, for instance, to dentists it would be invaluable for drying cavities of teeth previous to the insertion of the plug, and some were placed in the hands of a good dentist, who pronounced it excellent. I am yet in hopes that he, or some other dentist, who has tried it, will bring it to the notice of the dental college, so that there may be a demand for the article, and it can be prepared in large quantities, both for their use and that of photographers.

To return to the subject. It was with intense satisfaction I found that, when immersed in the mixed acids, there was no coaxing required to make the acids penetrate, but it would sink to the bottom of the vessel immediately. The next step was to devise a convenient form of vessel to mix the acids in, and to keep them up to their proper temperature. This was soon done by selecting, from the culinary department at home, two yellow glazed pudding bowls—one larger than the other—the smallest one holding about two quarts. The larger one being partially filled with boiling water, the smaller one was placed in it; into this was poured ten ounces of commercial sulphuric acid; stirring it with the thermometer, the temperature of the acid soon rose to 100°. I then added ten ounces of fuming nitric acid; the temperature at once arose to 165°; allowing it to subside to 150° the cotton was immersed enough to be well covered by the acid; pushing it well below the surface with glass rods, and, having covered the bowl with a dinner plate, let it stand for ten minutes, at the end of which time, the temperature was still 150°. Next, by the aid of a plate of glass three inches wide and twelve long, and a three-eighth inch glass rod, bent to a hook at one end, the cotton was lifted in a mass from the acids, and held to drain for a few moments, then plunged into a bucket of water, placed conveniently near, stirred about quickly, removed from this water into another bucket-ful near by, and then washed for a few minutes in the hands under the hydrant; next, renewing the boiling water in the outside bowl and adding two ounces more of sulphuric acid to the bath, I fed in a new lot of cotton, putting it through the same process as the first.

These cottons were then placed in a large glass funnel under the tap, well protected on the top by white flannel which served as a filter, and in this manner washed by a constant stream of water sinking through the mass for twelve hours, then dried in the artificial heat of a warm room. So far for the way to make the gun-cotton.

This cotton, in the hands of several good operators, was pronounced excellent, and its good qualities may be attributed to chance; but with the same lot of bleached cotton the same process was repeated at different times, but in exactly the same manner, always, however, using samples of acids from different manufactories. This was done to see if a slight difference in the acids would affect the result; but it did not.

The manner of heating the acids in a hot-water bath is, I have no doubt, practised by others, and is much better than using a spirit lamp, the large amount of hot water surrounding the dish being slow to cool. All the samples of cotton were sensitized in the same manner, and as the mode of sensitizing was rather peculiar, I will venture to give it.

The result of all my experience has been to confirm me in the use of the iodide and bromide of ammonium exclusively, and in no case do I ever, for any kind of work, use the salts of other metals. The quantity of collodion prepared at one time, is always one pint, never more or less. Bromide of ammonium is not soluble in absolute alcohol; but it is essential in making good collodion to have the alcohol as nearly absolute as possible. Hence I have adopted the following formula:—Into a clean graduate measure pour seven ounces of absolute alcohol; into this put sixteen grains of bromide of ammonium; stir with a glass rod, and endeavour to make it all dissolve; this cannot be done if the spirit is pure. Add a few drops of water and stir again, thus adding water, drop by drop, until it has taken up all the salt; next make up the bulk to eight ounces with alcohol; this ensures the alcohol having just enough water and no more. Into this stir eighty grains of iodide of ammonium, which will dissolve freely. Put into a clean bottle sixty-two grains of dry gun-cotton, and pour over it the sensitized alcohol; shake very well, and add eight ounces of concentrated sulphuric ether. The cotton will rapidly dissolve, and the collodion can be set aside in a cool dark cellar to settle, and will be ready for use in about three days.

In conclusion, let me call the readers attention to a fact in relation to collodion, first brought to my attention by Dr. C. M. Crenou, of Philadelphia, and to whom I am sure is due the discovery. If collodion, when freshly sensitized, be put aside to settle, and not disturbed in the least for several days, and then, when pure, if the first inch in depth in a pint bottle be drawn off carefully with a syphon into a clean bottle, it will be found to be very much more sensitive than the remainder.* The separation of this extra-fine collodion from the bulk does not seem to injure the balance. Hence it is an excellent plan to draw off this portion and set it by labelled for instantaneous photography.

* Condensed from *Humphrey's Journal.*

† One of the early difficulties encountered by Mr. Hardwich in his experiments, was the presence of a resinous coating on the fibre of the raw cotton, which he got rid of by boiling with caustic potash. Some experimentalists have conceived, however, that this resin acted on by the acids, communicated valuable properties to the resulting pyroxyline, and have, therefore, for other reasons than the extra trouble, declined to purify the cotton before submitting it to the acids.—Ed. Photographic News.

* This is a circumstance we have known to be verified in the experience of more than one intelligent photographer.—Ed. Photographic News.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 31st July, 1861.

Since we are never sure what construction may be put on our actions, it behoves us, especially while acting in a public capacity, to proceed with the utmost prudence and caution, so that no possibility may arise of our motives being impugned.

The secretary of your parent photographic society recently addressed a letter to the secretary of the Paris Photography, in which—taking into view the programme as originally issued by the Royal Commission of the forthcoming Great Exhibition—he urged that the proper course for (French) photographers to pursue would be *not to send any works to the Exhibition at all!* it being assumed by the London secretary that photographs were to be hopelessly consigned to the limbo of "machines, utensils, and scientific apparatus." It, however, unfortunately happened that Dr. Lyon Playfair's letter was brought before the society also at the same time as the London secretary's. As is well known, assurance is given in Dr. Playfair's letter that photography will doubtless occupy that place in the Exhibition to which it is unquestionably entitled among the fine arts. The astonishment of our society at the strange discrepancy between the two letters may be more easily imagined than described, and the natural conclusion is that the disingenuous letter of the London secretary is only a *ruse* to keep French photographers from sending their pictures to the Exhibition, and the natural inference is that British photographers are fearful of the consequences of the rivalry, which I, for one, am not at all disposed to admit. It is impossible to avoid the conclusion that the London secretary wrote with a sinister motive, but what that motive may have been is the secretary's secret, and the one assigned seems to be the only one that can harmonize with his extraordinary statement and recommendation.

M. Aimè Girard remarked that he could not help expressing his astonishment upon comparing the singular proposal of the London Photographic Society with the explicit language of Dr. Lyon Playfair, who, he was sure, must be regarded as the most competent person to judge in all matters relating to the classification of the Exhibition, and he thought there would be great danger to the interests of French photography in adopting Dr. Diamond's suggestion.

M. Laulerie, our secretary, said that under any circumstances, the worst kind of protest they could make against the classification of photographs in the Exhibition would be that of abstaining from sending any pictures to it; the very best protest, as it appeared to him, would be to send to London such a collection of brilliant photographs as would effectually convince the Royal Commission of its error.

The president of our society (M. Regnault) fully coincided with the opinions expressed by M. M. Girard and Laulerie. The high position of Dr. Playfair, his part in the organization of the Exhibition, gave the highest value to his letter, and rendered it more than probable that the demand made by the London Photographic Society would be successful. He added, in support of an opinion emitted by M. Robert of Sèvres, that as the French Photographic Society was not in communication with the Royal Commission for the Exhibition, it could only act through the Imperial Commission charged with organizing the French Section of the Exhibition, and therefore he proposed :—

1st. To address the secretary of the London Photographic Society, a letter embodying the views of the meeting.

2nd. To confer on the committee of administration full powers to act in this affair according as circumstances may require.

These propositions on being put to the vote, were unanimously adopted.

Mr. Cordier has communicated the following in the preparation of positive paper :—

To avoid the use of a bath of silver of 20 per cent. and at the same time to retain all the brilliancy of the albumenized proofs, and secure their preservation either before or after sensitizing, in Marion's boxes; he first coagulates the albumen by immersing the paper in the strongest and purest alcohol possible. Coagulation by dilute nitric acid, or by a heat of 212° alone, is useless; the proof, when the paper is afterwards placed in water, loses all its albumen, and consequently becomes dull and flat; with alcohol it is just the reverse. We sensitize the paper subsequently in a bath of crystallised nitrate of 5 per cent., which, not dissolving the albumen, keeps in good condition. If the experiments of other photographers confirm those of M. Cordier, it will be easy to avoid even the simple manipulation suggested, by requiring dealers to furnish the photographer with albumen paper, *coagulated by alcohol*. The cost is very trifling.

Count Schouwaloff has communicated to our Photographic Society the following method of obtaining positives by carbon printing.

He takes the usual gelatine solution, but doubles the quantity of carbon (lamp black) usually added to it, and diminishes the quantity of water. This solution is applied with a soft brush to a sheet of paper, and quickly dried by the application of a gentle heat.

The paper thus prepared is put into the printing-frame, the white side of the paper in contact with the negative. After exposure to the light, the proof is placed in a dish, gelatine side downwards, and hot water poured upon it. At first the black and opaque coating does not appear to be attacked; but, in a few minutes, upon being gently rubbed under water with a soft brush, the proof is brought out in a moment, and only requires rinsing in clean water.

This method, besides being simpler in manipulation than any other proposed for photographic printing, is also quite permanent; but it has the twofold disadvantage of reversing the image, and of being produced through the substance of the paper, thereby losing in sharpness.

I do not think the latter of these objections to be a very serious one, except in such cases as when an extraordinary degree of sharpness is required. With regard to rectifying the position of the image, this defect may be overcome by exposing the printing frame, not to ordinary light, but to the solar light, emanating from a Woodward's apparatus.

The shadows of the proof now obtained are so sharp, that it appears to me the image would traverse the double thickness of the glass and the paper without deterioration.

We can, therefore, in order to rectify the image, reverse the negative in the printing-frame.

The committee appointed to examine M. Anthoni's portable laboratory, for obtaining wet collodion pictures in the open air, report favourably. They think the apparatus is very ingenious, and calculated to be very serviceable, especially in taking instantaneous pictures; it is quite light and of portable dimensions.

A Photographic Exhibition will open at Marseilles on the 1st of September next, and the 15th of August is the last day upon which articles intended for exhibition can be received. No universal photographic exhibition has hitherto taken place in the South of France. The geographical position of Marseilles, together with its commercial relations, render it an important centre for communications with all nations; and the forthcoming exhibition cannot fail to extend the boundaries of photography. All professional and amateur photographers are invited to send pictures and apparatus to the care of the Secretary of the Photographic Society of Marseilles, previous to the date abovementioned.

M. de Luca obtains oxygen gas economically by passing the vapour of sulphuric acid through a porcelain tube heated to redness. The acid is put into a tubulated retort three-fourths filled with pumice stone, the stopper and joints are secured with asbestos and clay.

THE MEASLES IN ALBUMENISED PAPER.

Dear Sir,—Having heard from several of my friends that I have fallen into a great error as to the name I employed to designate the appearance in albumenised paper whilst toning, described in a former article, that the effect is usually called by the name of Mealyness, and that the measles is applied to a print improperly fixed, through being left too short a time or in too weak a solution of hypo, being dark spots seen upon looking through the paper. I beg to reply, that an immortal bard has said, "A rose by any other name would smell as sweet," therefore I suppose a photographer may justly exclaim, "A fault by any other name would be as bad." However, it is just as well that all should be agreed as to a name for a certain thing, that all may recognise it when they see it. To proceed, however, to practical remarks, I am happy to hear that numerous persons are getting over their troubles by the employment of the acetate of soda with the chloride of gold, as I cannot help thinking that by its employment or the citrate of soda, a great step in advance in lessening our difficulties is in progress; and if we are a little particular in choosing a paper with a fine texture, we shall hardly ever have to complain of want of success. The other effect, although one I did not think of mentioning, as all must know how to remedy it, leads to a no less important discussion; the question being how much hypo is really sufficient to fix a given quantity, say every whole sheet of paper. This has been satisfactorily answered by Mr. Dawson at the North London Society's meetings. That gentleman found that one part of chloride of silver was fairly and fully dissolved in three parts of hypo; now the amount of chloride of silver will slightly vary in different sheets of paper according to the absorbing nature and the thickness of the albumen employed, but I think its maximum may be taken at 30 grains or ½ a drachm, so that it will take 1½ drachms, or say ¼ ounce of hypo to fix each whole sheet of paper. Now comes the difficulty; how much water are we to employ? It is certainly not safe to use weaker than 10 per cent. of hypo; thus supposing we take 40 ounces of water, that will require 4 ounces of hypo, which, according to our calculation, will fix 16 sheets of paper. Now we cannot put more than two sheets cut up at a time, into this amount of liquid, and it will be therefore very slow work fixing, or we must employ a larger amount of solution. Hypo is now certainly very cheap, and there is not much loss in value in throwing it away; but there is another loss of far greater importance. All who have toned on a large scale, must have observed, that fresh hypo dissolves out a good quantity of the gold toning, until it becomes saturated with it. Thus, in the above quart of solution, the first two sheets would be, when fixed and dry, three or four shades lighter in tone than when they came out of the gold; from a cold grey to a warm brown afterwards: the second two sheets would be only, perhaps, one shade different, whereas all afterwards would be the same tone when dry as when they left the gold. This is not so much a difficulty to the professional printer, as he has only to begin with the "*Browns*," and end with the "*Greys*," but must be a trouble to those who only wish to produce one tone of picture, and that a dark one; and is in all cases a loss of gold, which is hardly worth the trouble of extricating from so large an amount of hypo. It gets precipitated along with the silver, by an alkaline sulphuret, by those who save their waste solutions. It was for the purpose of preventing this loss, and not to assist by toning by sulphuration, that Mr. Hardwich recommended using the hypo a second time, using chalk or common soda to keep it from acidity, as he said it improved the colour—rather a dangerous thing to say, as it looks ugly, and might have a suspicious meaning attached to it; it should rather have been, as it prevents the colour from deterioration. Most photographers, however, prefer now always to use fresh solutions; there is, therefore, no way of proceeding, but overturning the first proofs if darker tones are preferred. Perhaps Mr. Dawson, if not too much engaged with his avocations, will kindly reply to the above remarks, whether I have stated what I believe to be his calculations are correct, and also give us any further benefit of his experience in the above most important considerations.—I am, dear sir, yours sincerely,

Francis G. Eliot, Photographer.

Elm Grove, Peckham, S.E.

SHARP FOCUSSING.

Dear Sir,—I have adopted a simple and exact method to ascertain that my dark slides are correct with the focussing screen, which I think is much preferable to using a ground or collodionized glass in the dark slide in place of the screen, as in this case, not only is the eye a treacherous guide as to the image being equally distinct on the two glasses; but after having focussed the image as sharp as possible on the screen, you are not well able to judge, on substituting the dark slide, whether it exhibits the *sharpest possible* picture, without moving the lenses to and fro, and so throwing them out of the position they occupied in giving the image on the screen.

My plan is as follows:—

Remove the back portion of the camera (if sliding body) together with the screen. Upon the ground glass erect perpendicularly a strip of other ground glass, or a piece of wood, and place across the camera a glass plate or other rigid and level substance, and bring it in contact with the perpendicular strip; upon this, with the cross piece as a ruler, make a pencil mark: now remove the screen and substitute the dark slide (containing a plate), and repeat the operation.

The distance between the two pencil lines thus made will show how much, and in what direction the focussing screen requires correction: if the lines be coincident, the arrangement is correct.

If the camera be not a sliding one, the same method may be adopted by removing the lenses.

It is necessary to guard against using any pressure upon the perpendicular, as the spring which holds the plate will give way unless a firmer support be placed behind the slide. —I am, dear sir, yours faithfully, Focus.

Kilburn, N.W., July 27th, 1861.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

Dear Sir,—I am desired by the referees of the Amateur Photographic Association to state (since from the number of members there is no longer a doubt of its success):—

1. That the Amateur Photographic Association is now fully established.

2. That all negatives for this year should be sent in not later than Nov. 1, and as much earlier as possible.

3. That the secretary is prepared to negotiate exchanges for all members who may desire it, which exchanges will, as a matter of course, have no reference to the prints to be selected by each member.

4. That the adjudication of prizes will take place at the close of this year, or the beginning of next.—I am, dear sir, very truly yours,

A. J. Melhuish, Hon. Sec.

July, 1861.

Talk in the Studio.

South London Photographic Society.—The August open-air meeting of the South London Photographic Society will be held on Saturday the 9th instant, at Beddington Park. Members will meet at the West Croydon station at 2 p.m., and thence adjourn to the park.

Penny Photographs.—Photographic portraits of public characters, generally reproductions of engravings, are becoming regular articles of street commerce. A paper print of the ninth size (2½ in. by 2 in.) with glass and preserver, all being sold for one penny!

Congress of Artists.—There is to be a grand congress of artists of all nations at Antwerp next month. The gentlemen chosen by the Royal Academy, to represent English art are Sir Edwin Landseer, Messrs. David Roberts, E. M. Ward, Doo, and Westmacott.

The Beautiful.—Never lose an opportunity of seeing anything beautiful. Beauty is God's handwriting, a wayside sacrament; welcome it in every fair face, every fair sky, every fair flower, and thank Him for it, the fountain of all loveliness; and drink it in simply and earnestly, with all your eyes; 'tis a charmed draught, a cup of blessing.

Canadian Photographs.—We have recently received a parcel of very fine card portraits from Messrs. Nottman, of Montreal. Amongst these are some portraits we recognize, as that of Sir William Williams, of Kars, and others. As photographs, the pictures are very fine, being at once soft and brilliant: they possess at the same time a high artistic character, the arrangement of position, accessories, lighting, &c., all conducing to a satisfactory pictorial result.

The Comet.—Mr. John A. Whipple, of Boston, whose photrographs of the moon and stars and Donati's comet have excited attention, reports that the photographic power of light from the comet is very feeble, hardly making an impression on his most sensitive preparations. Compared with that of the moon, or fixed stars even of the third or fourth magnitude, it is, photographically speaking, *not one thousandth part as brilliant.*

Photography in Paris.—A recent Paris census gives no less than 33,000 persons as connected with the production of photographs and photographic materials! If photography deprived tens of persons in the shape of inferior miniature painters of a subsistence, it has manifestly provided employment and incomes for thousands of persons in their places.

Photographs at South Kensington Museum.—A recent report of the Science and Art Department, at South Kensington, informs us, that during the last year the demand for photographs far exceeds the supply. Since the opening of the offices, in October, 1859, to December, 1860, 15,584 have been issued. Negatives have been made from the *Liber Studiorum* of Turner; and, by way of experiment, to ascertain how far the assistance of private photographers can be employed in printing and publishing photographs, some have been invited to purchase these negatives at cost price: one established firm has undertaken to produce these, the Department reserving the liberty to sell other negatives of the same work, if the public call for better or cheaper impressions. The firm referred to is Messrs. Cundall and Downes, and from what we have seen of their copies of the *Liber Studiorum* we venture to assert that better copies or at a cheaper rate cannot possibly be desired. We hope shortly to have a more extended notice of these valuable reproductions

To Correspondents.

F. K.—The India paper effect to which you refer in mounts for photographs is sometimes really India paper, and in other cases a tint produced by lithography. We cannot tell you where such mounts are to be procured

M. C. C.—The achromatic stereoscopes to which we referred, cost, we believe, about £2 each. We prefer whole lenses to prisms.

W.—So far as our own experience goes, we should say No. 3. Add, say six minims of strong ammonia, and two grains of citric acid. A longer exposure is not required. We prefer the plate thoroughly well washed before applying the albumen. If working wet collodion in the field, it is not absolutely necessary to fix immediately after development. If the plate be properly washed after development, the fixing may be delayed to a convenient season. The chief difficulty to be guarded against is loosening of the film from the repeated operations of drying and rewetting.

. Gordon.—Franc's has two kinds of rolling presse , one acting as a kind of burnisher, and the other by acual rolling presser . The latter is, we believe, considered most efficient. Marion has also a rolling press, of which we have heard good accounts. The prints, after mounting, should be quite dry, before being rolled. We should have pleasure in seeing the Indian stereographs to which you refer.

F. S.—The means of producing intense negatives by iron development depends on several conditions, one of the most important of which is the use of a collodion with sufficient tendency to density, and a strong bath in good order. We shall have an article on this subject shortly, probably next week, as it cannot be treated fully here.

Alpha.—All single view lenses give curved marginal lines; but if the lines converge, as you state, towards the top of the picture, that arises from the camera being tilted. In taking a building, no matter what lens you use, it is imperative, if you would prevent this distortion, that the plane of delineation, or, in other words, the sensitive plate, be quite parallel to the building. In taking a landscape, including many objects, we prefer focussing for the foreground, unless it happen that some other object be of vital importance; but in taking a building it is necessary to use a little judgment and select that point for focussing which gives the best general result. In many cases the most interesting architectural point of the building should be chosen for focussing, but each individual case will require judgment, as no rule can be given. The triple lens is the best for giving perfectly straight lines and freedom from distortion.

F. E. G.—A bath made with pure re-crystallized nitrate of silver, 35 grains to the ounce, with the smallest possible proportion of acid which will make it work satisfactorily; a bromo-iodized collodion, and iron developer, are all required for instantaneous work in a good light. The bath made as you describe it, will answer admirably, we have no doubt, with the excellent lenses you have procured.

F. S. Beatty.—We forwarded the letter as desired. We shall have pleasure in receiving the illustration referred to, and hearing more about your process.

T. S. Swatridge.—The specimen forwarded has many points of excellence, being a soft and artistic picture. The head is scarcely quite sharp, and the drapery might have been a little better illuminated and rounder; but, as a whole, the picture is very good, and displays artistic feeling. The printing also is very good, although a little more broken form of vignette would have been an improvement. A vignette of regular oval shape is somewhat formal. We shall be glad to hear of your process.

W. A. Y.—1. In adding oxide of silver to a bath containing nitric acid and acetic acid, the nitric acid will act on the oxide first and form nitrate of silver, and if you could just add sufficient to neutralize the nitric acid and no more, acetate of silver would not be formed, but as you do not know the exact amount of nitric acid present, it is almost certain that acetate of silver will be formed in neutralizing the bath. 2. If you add a very dilute solution of an alkali a drop at a time, and test carefully between each addition, the nitric acid being neutralized first, you may, possibly, avoid the formation of acetate of silver. 3. Nitric acid may be liberated in a bath in the regular process of working, by the use of a collodion containing much free iodine, as then the nitric acid is set free from the nitrate of silver, by the formation of iodide of silver, and no other base supplied to combine with it. 4. When you have once got excess of acetic acid into a bath it is very difficult to eliminate, the best plan is to neutralize it with oxide of silver, and then reduce the temperature of the solution as low as possible, which will cause the excess of acetate of silver to crystallize, and it may then be filtered out. Or dilute the bath with an equal bulk of distilled water, which will precipitate the excess of acetate, filter, and then add sufficient silver to make the solution the proper strength. 5. To make oxide of silver add a solution of caustic potash to a solution of nitrate of silver until it is all thrown down as a brown precipitate, which is oxide of silver; wash well and it is ready for use. 6. Add the oxide of silver in excess and then filter. 7. We do not like old collodion baths saturated with iodide of silver for printing purposes. To remove the iodide proceed as we have described for the acetate. When an old bath fails to give good pictures renew it by adding new solution of full strength.

R. Keene.—We have communicated with Mr. White who informs us that he gave the negative to the sculptor, Mr. Thorneycroft, from whom, or from Spooner, Southampton Street, Strand, it is possible a print might be obtained.

E. N. C.—The mottled appearance in your print is from imperfect fixation. You have used a hypo bath either much too weak, or exhausted from long use. The consequence is, the formation of insoluble hyposulphite of silver, which nothing can remove from the picture. Use a fresh solution of hypo, one ounce to four of water. We are always glad to assist our readers, but we cannot accept any remuneration for our advice.

J. W. S.—The Fothergill process is the simplest dry process. See the Photographic News Almanac for a complete epitome of all the dry processes.

E. H. B.—The only modification your method of manipulating seems to require is more careful washing before immersing in the hypo. The fault appears to be in the paper, and we regret to say is at present of very common occurrence. We were surprised at the statement to which you refer, about a quarter of an hour in the hypo we have always found sufficient in our own practice.

A Distressed Photographer.—A wooden bath coated well with shellac might doubtless answer for the silver solution. A better plan still, is that adopted by Mr. Francis, of lining wooden baths with thin sheet india-rubber. We have one in use at present, and intend to report shortly. 2. A bromide in the collodion shortens the exposure where iron development is used. 3. Dr. Hill Norris has two dry processes, one of which has has been published; the other, the rapid one, is a secret. We have for years used kaolin to decolourize the nitrate bath. Our plan is to place a little kaolin in the funnel inside the bibulous paper, and thus filter through each time in returning the solution from the dish to the stock bottle. When pouring into the dish for use, we never drain the bottle, but leave any sediment undisturbed; we also remove any floating scum with a strip of paper, and thus have no sheets wasted. 4. The coagulation of the albumen has been proposed and would probably be beneficial. See letter of our Paris correspondent in the present number. 5. Mr. Fry's plan is to use common water: he finds it successful. 6. Holes in an unvarnished negative are certain to occur from contact with the paper in the pressure frame. We shall be glad to hear of your results with the Rev J. Lawson Sisson's process.

Photo Student.—We think it is not desirable to insert your letter as we have no desire to open our pages to recriminatory correspondence, or emulate some of our contemporaries in becoming the vehicle of offensive personalities. We cannot tell you where you may enter on "a course of Billingsgate," in order to reply efficiently; nor can we recommend you to enter upon the study. In any case you cannot "exercise" in the pages of the News.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 153.—*August* 9, 1861.

FREE IODINE IN THE SILVER BATH.

Have any of our readers tried the addition of free iodine to the silver bath as proposed by M. l'Abbé Laborde?* We have tried it, and we must confess to disappointment in the result. It will be remembered that the Abbé premises his announcement by the statement of a case which every photographer is too familiar with: namely, that whilst to secure the highest conditions of sensitiveness a neutral silver bath is desirable, that neutrality generally has a tendency to bring with it another evil, the disposition in the shadows, or *reserves* as he calls them, to veil or fog. To get rid of this, it has been generally found necessary to give the bath a slightly acid reaction, and with this amount of acidity, added, there is often a slight amount of sensibility lost. To meet the difficulty here involved the Abbé announced that the addition of iodine, to the bath already saturated with iodide of silver, was a complete remedy for this tendency to fogging, whilst it in no degree diminished the sensitiveness of the film, or caused any acid reaction. The first statement of this case will, to the photographer at all aware of the reactions which take place in the processes he works, appear to involve a contradiction. He is aware that on immersing a plate coated with iodized collodion, into a bath of nitrate of silver, a process termed double decomposition takes place, in virtue of the greater affinity existing between iodine and silver, than between these elements and the bodies with which at the outset of the process they are associated. Thus the nitrate of silver is decomposed, and the silver combines with the iodine, whilst the base with which the iodine is associated, say potassium, combines with the nitric acid and oxygen liberated by the decomposition of the nitrate of silver, and forms nitrate of potash. If, however, free iodine be brought in contact with a solution of nitrate of silver, iodide of silver is formed, and nitric acid set free in the solution, there being no base present with which it can combine. Photographers are aware of the value of free iodine in a collodion intended for positives, which causes it to give clear shadows and silvery whites. This is due to the liberation in the nitrate bath of a minute trace of nitric acid, the well known operation of which is to produce such results.

M. Laborde is well aware of this, and to account for the novel circumstance which he announces, remarks—"We cannot apply the ordinary laws of chemistry to this fact; or, rather, we must search deeper into these laws to find an explanation of it. For every chemist will think that iodine in contact with nitrate of silver will remove the silver, and set some nitric acid free; this acid would then act like most other acids, in opposing the reduction of the silver upon the reserves. But it is found that the prolonged contact of iodine with the silver bath, well saturated with iodide of silver, does not cause it to lose its neutrality; the nitrate bath containing iodine may be heated nearly to ebullition without manifesting subsequently any acidity."

In order to test this valuable quality we made a new nitrate bath, thirty-five grains to the ounce, of very pure neutral nitrate of silver: to this we added iodide of sodium in order to saturate with iodide of silver. We then filtered and tried a plate. The bath on being tested was found neutral, and worked quickly, clean, and well, with the exception of giving a slight veil to the shadows. We then added a little iodine, using for convenience a few drops of a concentrated tincture of iodine. Another plate was tried, and the shadows were at once found clearer; but the deposit was observed to possess a much more silvery whiteness viewed by reflected light, and a tendency to greyness when viewed by transmitted light. The plate taken first was then compared with this, and found to be much more of a brown tint by reflected light, and a reddish brown by transmitted light. The change was strikingly suggestive of the action of nitric acid, and on again testing the bath with blue litmus paper, a faint acid reaction became manifest.

Unwilling, on slight evidence, to come to a conclusion opposed to that announced by an authority so eminent as the Abbé Laborde, we conceived the possibility of the solution not having been perfectly saturated with iodide of silver to commence with, a point on which the Abbé had laid some stress.

Taking, therefore, a portion of the bath, we added more iodide of sodium until it was in considerable excess. We then, having first neutralised the solution with oxide of silver, added, not tincture of iodine, but a few grains of iodine. Blue litmus paper remained for some time unchanged, but gradually became reddened, commencing at a point where it was in absolute contact with a portion of the iodide.

Still willing to attribute the result to some failure in the conditions laid down, we read M. Laborde's statement of the case again, and observed that he described a slight acid reaction as sometimes the consequence of atmospheric action, independent of the iodine, and we began again, this time using fresh preparations. Instead of using iodide of sodium, we used iodide of potassium, adding it in excess to the silver solution, and allowing it to stand for twenty-four hours, so that it might get thoroughly saturated with iodide of silver. We procured a fresh and very fine sample of iodine, the one previously used having stood in our laboratory ever since the days when it was needed for daguerreotype purposes, and might, possibly, not be in the best condition. We now followed the Abbé's instructions carefully as to quantity, and added one part of the iodine to two hundred parts of the solution, and instead of allowing it to stand in an open vessel as before, it was placed in a stoppered bottle. Very slowly the blue litmus paper, which had remained in the solution before the addition of the iodine for half an hour without change, now began to assume a lavender and then a pink hue; as before, first showing the change where a particle of the iodine touched it,

The neutrality of the solution was in all cases carefully ascertained previous to the addition of iodine, and, where it was doubtful, placed beyond question by the addition of oxide of silver. We have one other experiment to record, which slightly differs in conditions and results from those just stated. In order to vary the mode of examination, we took an ounce of an old silver bath in good working order, but which, having been in use for three or four years, was, of course, saturated with iodide of silver, and unquestionably contained free nitric acid. This was neutralised with oxide of silver, and a few grains of iodine added. In this case no apparent change took place; the iodine remained unaltered, and blue litmus paper retained its colour for a great part of an hour, when the solution was removed. In the other cases a gradual agregation of yellow particles of iodide of silver formed round the fragments of iodine, contemporaneously with the change of colour in the litmus paper.

It will be remembered that our German correspondent, Herr Liesegang, an intelligent and careful experimentalist,

* Vide letter of our Paris Correspondent in the number for June 28th, p. 308.

stated in his communication a few weeks ago, that he had tried M. Laborde's suggestion with perfect success. That the shadows of pictures produced in a bath so treated were remarkably clean, and the collodion positives very brilliant in tone. He does not state, however, whether he actually tested for acidity. If he did not, the results obtained are just those consistent with the presence of nitric acid, the fine tone of the collodion positives essentially pointing in that direction.

In conclusion we merely assert that in our hands, and in the series of experiments recorded, whilst the end was gained, it appeared to be by the liberation of a very minute trace of nitric acid, which, whilst it gave clearness to the shadows, did not appreciably interfere with the sensitive condition of the bath. We would be far from asserting, however, that under other conditions, not yet precisely indicated, the exact results indicated by M. Laborde would not take place. It is only fair to assume that so eminent an authority is precise in stating the case as it presented itself in his hands, but that some conditions which escaped his attention are necessary to secure the same result, and which in our experiments with a new bath—the case where they would really be needed—were absent. We shall be glad to hear the result of other independent experiments.

VALEDICTORY.

The private life of public men is not public property: yet, in so far as the purposes of the private life affect public relations, they become, very naturally, matters of general interest. The retirement from all public connection with photography, on the part of one who has so long held a foremost position, as an expositor and authority, in regard to all its scientific subtleties, may justly be regarded as a matter of legitimate interest amongst photographers at large. Those who had the privilege of possessing the friendship of Mr. Hardwich have known for some months past that his labours and public connection with photography had ceased, and that his future career would probably be in the church. To a gentleman of a disposition so pre-eminently modest and retiring, we conceived that any public mention of these facts could only be painful, and we have abstained from all reference to the subject. As two of our contemporaries have now alluded to the matter, we can have no further delicacy in informing our readers of a fact which will possess to them a regretful interest, and in seizing the opportunity of expressing our high sense of the obligation the art and its votaries owe to the labours of the retiring *savan*.

In a letter before us, addressed to a friend, a couple of months ago, Mr. Hardwich states that he is now stationed in a large mining and manufacturing district assisting the clergyman to visit and look after his people, and that if his health will permit he will shortly enter into holy orders with a view to "spending the remainder of his life in preaching the gospel." He says, "I have long wished to do this, but not until lately was the way opened up before me. At present I am visiting the sick, prescribing for some, reading to others, and occasionally giving addresses and cottage lectures to the people. Photography, as you may imagine, is at a standstill." He concludes an interesting letter by stating that he shall always feel interested in the progress of the art, and by sending kind remembrances to ourselves and other photographic friends.

However much we may regret the loss to photography of one who, by education and habit, had rendered himself almost necessary to its scientific progress, it is not a matter which permits a word of comment. If what is generally regarded, at least in a worldly sense, as honour and profit had been his aim, we believe it was to have been found in photography. But motives of a higher order have unquestionably dictated this step, and we cannot but regard it as somewhat derogatory to the man, and altogether misappreciative of his motives, to suppose that the rewards photography has to offer were insufficient to retain him as one of its chief expositors. A man so conscientious cannot fail to be useful, however, whatever may be the field of his labour. We have reason to believe that in the mining districts of Durham he will find a sufficient number of earnest minds to render it a not altogether ungenial sphere, and we cordially wish him good speed in his new vocation.

Science is already largely indebted to men in the church for many of its most valuable contributions; and it is but fair, perhaps, that on some occasions an interchange of good offices should thus be made. And as the pursuit of science is not in any way incompatible with the ministry of the gospel, perhaps we may hope, that at some time other "Recreations of a Country Parson" than those which have been recently delighting the reading world, may appear for the gratification and instruction of photographers.

A correspondent in a contemporary has suggested the propriety of some formal recognition of the value of Mr. Hardwich's services amongst us. There are few, we believe, who would hesitate to acknowledge and recognise those services; but we cannot but think that the necessary publicity of such a recognition would, under the circumstances, be wholly, and without mitigation, a source of pain to the gentleman to whom it would be intended as a compliment.

Notes and Jottings.

No. 9.

Photolithography: A Suggestion.—Intensifying Dry Plates with Bichloride of Mercury and Iodide of Potassium.

Photolithography continues to claim some degree of attention from time to time. So far as regards the reproduction of subjects without half-tone—that is, half-tone as photographically understood—some specimens we have seen from two or three sources have little or nothing to be desired. Still, however, we hope in time to attain some means of approaching somewhat nearly the gradations of the photographic print. At present, even a rough approximation to the desired end can hardly be said to have been got. The results of experiments are, however, "promising," and therefore we shall continue to hear more on this point for some time yet to come.

To those who may have the means of conducting experiments in this direction, we offer a hint which we do not remember to have seen previously published.

Lithographers are in the habit of using gum arabic to "stop out" on the stone. Wherever the gum touches, although all the surface be afterwards covered with grease, those portions will print white. Now if we take a paper coated with bichromate of potash and gum arabic, and expose it under a negative, we get the well-known effect of insolubility in the exposed portions, and solubility in those unexposed. Placing the print thus obtained, face downwards, on a prepared stone, slightly damping the back, and passing through the press, the soluble parts, otherwise the whites of the picture, are transferred.

We thus get a negative copy of the photograph on the stone. When dry, the whole surface may be covered with grease, after which the lithographer may proceed in the usual manner.

At present this is only a crude hint, but we may have more to say on the matter shortly. Any suggestions, however, on this important subject will not, in one sense, be thought entirely without value.

In our last "Jotting," when speaking of intensifying by means of bichloride of mercury and iodide of potassium, we promised to say something on the application of the process to dry plates. This promise we now redeem. The action of the solutions on dry plates will be found far more energetic than on wet. This to a great extent is, perhaps, owing to the organic state of the film. The solutions should, therefore, be largely diluted, especially the bichloride of mercury, If this latter be allowed to act too strongly, the image will quickly whiten, in which case the resulting negative will be yellow, whereas we prefer its being a yellowish brown. The use, however, of ammonia in the iodide solution will bring the colour back to the desired tint.

Cyanide, used in fixing, should not contain much silver in solution, or, at all events, the film should be well washed after its application; for if any free silver remains in the pores, it may be thrown down as an iodide, and thus a slight veil cast over the negative.

In other respects proceed as with wet plates.

M. Hannaford.

Scientific Gossip.

We have received several more samples of glass from various correspondents, who desire to know the results of an examination of the same in the spectroscope. If these pieces are to be considered as a fair illustration of the sort of protecting medium behind which photographers are in the habit of working, they certainly show that more than half the failures should be attributed to the passage of chemically acting rays into the dark room; the only reason why good pictures are ever taken by some amateurs and professionals being, that in addition to the coloured glass, they cover the window with two, three, and in one case even four thicknesses of yellow calico. This occasions such darkness in the room that considerable quantities of actinic rays might pass through the screens without being sufficient to affect the sensitive plate. In fact, the human eye is so far superior in sensitiveness to the most delicate collodion film, that we have, on more than one occasion, sensitised and developed collodion pictures in a room illuminated with ordinary daylight; no colouring medium whatever being employed; the shutters and curtains of the window being so nearly closed that only sufficient light was allowed to enter to enable us to see what was going on in the distant corner where we had planted the bath and developing tray. by taking care to keep the plate overshadowed as much as possible, and only examining it once or twice towards the end of the developing process, very excellent pictures were obtained, perfectly free from fog or stains of any kind.

It is therefore evident that by reducing the light in the dark room to the least amount with which it is possible to work, the perfect exclusion of actinic light by the yellow glass or fabric, is a matter of very little importance. This, however, is a most unsatisfactory way of working, and since the information which we are now in process of detailing in these columns will enable anyone to work in almost as bright a light as they may desire, we do not imagine that many of our readers will continue groping about in "darkness visible," manipulating more by touch than by sight.

We will adopt the same arrangement in describing the glasses, as we used in our last "Scientific Gossip." Any references which may be necessary will be made to the diagram there given.

10, F. W.—This specimen of glass is of a green colour, apparently coloured with copper. All the red end of the spectrum is cut off below C, but apparently very little of the blue end is obliterated, although it is much weakened. The green rays are apparently seen to encroach considerably on the yellow and blue parts of the spectrum. This glass, it will be evident, is of scarcely any value for photographic purposes.

11, Dr. H. (Ireland).—This is a flashed glass of a deep orange colour. It exercises a strong action on the spectrum, entirely cutting it off above E, and partially obscuring it from D to E. The whole of the green, blue, indigo, violet, and invisible rays are therefore intercepted, and no danger need be apprehended when this glass is used to illuminate the dark room, however strong the light may appear which passes through it.

This glass is identical in tint with a piece which has been forwarded to us by Mr. Crookes as a specimen of the colour which he has been, for some years, in the habit of using for photographic and experimental purposes. He describes it as being quite opaque to all rays above E, transmitting only the orange, yellow, and red rays; the transmitted light being quite free from action on a collodion plate, under all circumstances which could happen in the practice of photography. This piece of glass is at present at our office, where it is open to the inspection of anyone who may wish to examine it.

12, L. D.—A brilliant lemon-yellow glass. A very decided effect is produced by this glass upon the violet end of the spectrum, cutting the whole of it off above G. As, however, the indigo and blue are left in scarcely diminished strength, the glass is unfit for photographic purposes.

The yellow, orange, and brown glasses, which we have hitherto examined, may be divided into three classes, according to the colouring matter employed in their preparation. Class I. consists of those coloured by iron; Class II. those in which carbon is employed to give the colour; and Class III. in which the colouring agent is silver in the form of silicate of the oxide. The first and second classes are worthless, except in several thicknesses, numbers 6, 7, and 8 being of this kind. The third class, of which No. 11 is an example, coloured with silver, is the only kind which should be employed for photographic purposes, and if our glass manufacturers would but devote a little attention to this subject, a very perfect article would soon be able to be obtained by every photographer. As at present made, silver-coloured glass is mostly flashed, *i.e.* coloured only on the surface, the bulk of the glass being colourless, and the stain being produced by an excessively thin film of a very dark-coloured glass on one side only. This is wrong in principle, although it may frequently act well in practice. According to this plan of colouring the glass, it it impossible to regulate the thickness of the colorific film, and, as a natural consequence, no two sheets are alike in colour. Another objection is, that any chip or scratch on the coloured side removes the colouring matter and allows white light to pass through. The same piece of glass is also liable to vary considerably in colour; a sheet six inches square frequently being several shades darker at one end than at the other. The proper plan would be to make the sheets of glass from a pot of "metal" which has been previously coloured to the proper intensity throughout its mass, by addition of the requisite quantity of silicate of silver: this could then be worked into sheet or plate glass of different thicknesses, and of any desired tint for the use of photographers. It is surprising what a strong opacity to the chemical rays, is produced by the slightest trace of silver in glass. It is owing to this cause that some lenses are so much slower than others. In order to obtain the glass of great density, which is necessary for grinding the curves for *rapidly-acting* lenses, the maker is obliged to add a considerable quantity of lead to the material of which the glass is made (some of Faraday's "heavy glass" actually contains half its bulk of metallic lead). Now it is a curious circumstance that lead and silver are almost always associated together in nature, all commercial lead, unless specially purified, containing certain quantities of the precious metal, even after it has gone through the separating by Pattinson's beautiful process; and when so large a proportion of lead is added to the optical glass, the silver which is introduced at the same time becomes sufficient to communicate a decided opacity to the higher, chemically acting, invisible rays. It is more than probable, if some of our large glass-melters were to take the precaution of only employing for their optical glass, lead chemically purified from every trace of silver, that photographic lenses could be made to act far more rapidly than they do at present; for, as now made, there is scarcely a sample of optical glass without some silver in it.

Another fact connected with this silver-coloured, flashed glass may be worth mentioning. If the surface be examined minutely, by transmitted light, with a magnifying glass, it will be seen to present a decided mottled appearance, looking as if the colouring matter had been laid on in powder, and had then been fused into the sheet of glass. In default of an examination by the spectroscope this appearance may be used to ascertain whether a piece of glass has been coloured by silver or not. If it present this peculiar appearance, it may be generally taken for granted that silver is the colouring matter employed, and then the photographer need only select the darkest piece he can find.

This connection between the sensitiveness of silver compounds to the actinic rays and the opacity of silver-glass to the same kind of light is more than a mere coincidence.

NEW VARNISHES.

We have received from Mr. Henry Rigge two samples of varnish possessing somewhat novel characteristics, and which promise, if all claimed for them prove true, to be very useful to photographers. They present themselves at the outset with the novel character of being spirit varnishes, but requiring no heat, prior to or after their application to the collodion film. Benzole and chloroform varnishes, it is well known, may be applied without heat, but the gums soluble in these fluids have been generally of the soft and friable character, which have rendered them unsuitable for the protection of negatives. Spirit varnishes have generally contained harder gums, and have been for this reason preferred as negative varnishes; but they have always required the plate to be warmed previous to their application, and a sufficient amount of heat during their drying has been necessary, to prevent the varnish from chilling. This, during the summer months, is frequently a serious inconvenience, as there is not generally a fire accessible, and the heat of a flame, whether from gas or a spirit lamp, is not well suited for the purpose, a red, even glow answering best. A spirit varnish, then, which claims to be as hard as other spirit varnishes, and is able to dispense with heat during its application, is at least worthy of attention.

The samples consist of a negative and a positive varnish, both of which when poured on glass dry perfectly brilliant without heat, and give a very beautiful even textureless layer of gum. In a short time they are set, and appear, to the touch of the finger-nail, perfectly hard. Our experiments with them have necessarily been limited, but we were scarcely so well satisfied with the results of our trial on the collodion film. We varnished a negative and allowed it to dry without heat, a very fine even film of varnish resulting. Intending, however, to put it to the most trying test, we placed a piece of sensitive paper not perfectly dessicated, but still slightly moist, so that in the pressure-frame it was pressed into that extremely firm contact which its limp moist condition rendered easy to accomplish. It was then placed in the full blaze of a mid-day sun, and when the outer glass of the pressure-frame had become very hot the print was removed. The varnish had certainly under this treatment become somewhat tacky, and the print pulled portions of the film away with it. These are conditions which we should scarcely apply in general printing operations; but in experiments of this kind we prefer to try extreme tests. The same varnish when applied with heat, appears to become harder, and less subject to subsequent tackiness under the influence of heat.

The positive varnish gives a beautiful surface to which powder colours adhere tolerably well. In experimenting with it we must mention one curious circumstance of a kind we never before met with. A collodion positive which had stood in a box, unvarnished, for the last four or five years, was varnished with this positive varnish, when the most singular result followed; it began to be covered with white arborescent tracings, which quickly ran into each other, and finally, in a few minutes, the whole plate assumed a beautiful opalescent appearance, altogether unlike the granular effect produced by the chilling of a spirit varnish. As we have coated several other collodion positives from the same bottle, and in the same manner, with perfect success, and obtained a beautiful transparent surface, it would scarcely be fair to regard it as the result of any imperfection in the varnish. It would rather suggest the possible existence of some amount of decomposition in the collodion, which had been kept for many years unprotected, and which was easily acted on by the varnish. We mention the circumstance chiefly because of its unusual character. A subsequent application of the same varnish and the aid of heat restored the picture to its proper condition.

Mr. H. N. Brunelliere, who is, we believe, the inventor of the varnishes, thus writes on the subject:—

"Both varnishes are made with one of the hardest gums known, rendered still harder, and pliable as gelatine, by a complicated chemical process, as you may see by the tenuity, transparency, and pliability of the films sent as samples.

"They are both of the same nature, the positive holding less gum in solution, and a small portion of another gum adopted to take powder colours.

"They possess the advantage of drying bright, without heat, and, therefore, are found very useful when artificial heat cannot easily be procured, with the facility of heating the film at any time afterwards, after printing, if you like, and get it as hard as any varnish known.

"The negative may be used in mounting micrographs, or microscopic objects, without the aid of heat, drying rapidly on any very cold material, as you will see by the pieces of glass cemented with it.

"Benzole varnish is found useless comparatively, either for its offensive smell, or for the softness and brittleness of the gums employed in its manufacture, to say nothing of the bad colour it imparts to positives when the proper amount of gum has been used so as to make it dry bright."

Some films, or layers of the varnish, very similar to very thin gelatine, were forwarded to us, which showed that the gums possess considerable toughness. The negative varnish appears also likely to answer the purpose of a cement for glass in some cases, as the two pieces of glass referred to illustrate, being joined so firmly that we cannot separate them.

As we said before, a varnish coming with such claims is at least worth a trial by those whom it may concern. In making trial at any time of a new varnish for negatives, we would suggest that it should be done on one of little value, as good negatives should not be subjected to any unnecessary risk.

WASHED COLLODION PLATES.

BY M. A. GAUDIN.

Some years ago I asserted that the presence of nitrate of silver upon the collodioned plate during exposure was quite useless, and that, consequently, it might be entirely removed from the plate with the advantage of obviating many important inconveniences. Since then, in consequence of a hasty experiment I made upon an opinion expressed by Mr. Thomas Sutton, I declared myself in error, and that, doubtless, my first experiment had been badly performed: but I formed the project of attesting a fact announced by Mr. Sutton, viz.:—that wet collodion plates when washed never yield strong negatives, whatever the amount of exposure. This I concluded was due to a faulty development: the researches I made on this point have led to certain results of the highest importance, which cannot fail to immediately realize a great improvement in the employment of collodion.

Every photographer must have experienced great annoyance in operating with wet collodion in the ordinary manner. He is obliged to expose the sensitised plate with as little delay as possible, being limited to a few minutes after the plate is removed from the nitrate bath; if the exposure be delayed, especially in hot weather, failure is the result; and even when the operation has been prompt, the plate is frequently stained by contact with the fingers or the slide. This inconvenience need exist no longer, for a wet collodioned plate when washed of its nitrate *is quite as sensitive* as when it is covered with nitrate; it is only necessary to know what mode of development to pursue.

To satisfy myself of the correctness of the principle, I repeated my old experiment, but this time on a long plate adapted to a binocular stereoscopic camera, which removed every chance of error. After sensitizing a plate, and allowing it to drain for a few minutes, I washed one half of it in a vessel full of river water; then, after exposure, I replaced it in the nitrate bath. In proceeding to develop the plate, the unwashed portion gave a very pure image, while the washed portion was veiled; but, what was most important, the latter had as much reduced silver upon it as the former; thence I concluded, that washed plates only required for their development a developer more strongly acidulated. In fact, washed plates developed with a reducing agent, which operated slowly, give pictures of the first quality, while their sensibility is exactly the same: only it is necessary to observe certain conditions which obviate the effects of the washing.

Washed collodion-plates are not only quite as sensitive, when properly developed, but we at once perceive that this washing is a means of obtaining an unusual degree of sensibility, as we can introduce into the washing-water a host of reagents capable of penetrating the sensitive film, and thus concur in the rapidity of the exposure.

It has been objected that my plan of washing the plate in plenty of water, without afterwards rinsing in distilled water, always leaves some nitrate on the film: and this is true; but in the present case, the object is not to wash the plates, and then to dry them completely, but rather to suggest a practical method of operating with wet collodion plates kept for several hours, which is all the latitude required in most cases.

By washing in plenty of water, not followed by a rinsing, the water remaining upon the plate contains at the most, a thousandth part of nitrate of silver. For the same vessel of water will serve for a whole day's operations, and if this thousandth part is considered necessary to exposure, I grant it; the fact is, that *it suffices.* This minute quantity acts as efficaciously as a quantity a hundred times greater, but without the inconveniences of the latter, and moreover this method of washing is more practical.

Thus, then, in washing sensitized plates in a large earthen or glass dish full of river water, we leave upon the plates only a ten-thousandth part of nitrate at the beginning, and a thousandth after washing about forty plates. It is well understood that in employing ordinary water, before washing the first plate, a little of the silver bath must be added to it, to neutralize the salts it may happen to contain; besides this water must be acidulated by the addition of one per cent. of acetic acid.

In washing the plates, it is evident that we introduce into the substance of the sensitized film, in lieu of nitrate of 10 per cent., a nitrate at least a hundred times weaker; therefore, before proceeding to developing, it is necessary to restore the balance. This is realized by putting the plate into the bath; but its stay in it must not be momentary, as usually practised, it must be left in the bath several minutes, and proceeded with exactly as with a plate being sensitized. After this, it is left to drain for a minute, before proceeding to development.

When a washed plate has remained only a quarter of an hour in the air before exposure, it is useless to return it to the bath; we pour on its surface the developer, to which nitrate of silver of the strength of 3 per cent, is added, the quantity of developer being very small, and when the image appears, some *pure* developer is added.

Developers with an iron base, cannot be employed except with plates returned to the bath, and always with a large proportion of acid. I employ a special pyrogallic-acid developer, which yields very pure positives, with brilliant whites, or negatives of extraordinary intensity, according to the length of exposure.

By washing the plates we completely avoid the stains arising from the frames. When the developer with nitrate of silver is poured on the film it spreads quite readily of itself, and as it acts slowly, the image is developed with limpidity.

I have also made an experiment with a view of obtaining still greater sensibility by modifying the washing water, and I have succeeded beyond my hopes.

Besides acetic acid I have added to the washing water a small quantity of tannin (15 grains to 10,000), and after sensitizing a stereoscopic plate, I washed two-thirds of it; after exposure, and returning it to the bath, developing produced upon the washed portion a negative twice as intense as that portion which had not been washed, but the strongest negative was a little fogged, although good to print from; I believe, therefore, that the addition of tannin is advantageous, but the quantity must not exceed half the quantity indicated above.

THE THEORY OF THE PRIMARY COLOURS.

An interesting lecture on this subject was recently delivered at the Royal Institution, by Professor Maxwell, in which he mooted the novel theory that the three primary colours instead of being, as is commonly, red, blue, and yellow, are red, blue, and green. As our readers know, the latter colour is generally held to be a secondary colour, the product of a mixture of the two primaries yellow and blue, in the same way that purple is the product of a mixture of red and blue, and orange of the mixture of red and yellow. Professor Maxwell holds, however, that green is not a secondary mixed colour, but a simple and primary colour, and that yellow, instead of being a primary colour, is the result of a mixture of red and green; and he illustrated his position by producing yellow by the refraction through a prism of red and green light. The lecture was further illustrated by photographic transparencies taken for the purpose by Mr. Sutton, who in the *Notes* gives the following account of their production:—

"A bow made of ribbon, striped with various colours, was pinned upon a background of black velvet, and copied by photography by means of a portrait lens of full aperture, having various-coloured fluids placed immediately in front of it, and through which the light from the object had to pass before it reached the lens. The experiments were made out-of-doors, in a good light, and the results were as follow:—

"1st. A plate-glass bath, containing the ammoniacal sulphate of copper which chemists use for the blue solution in the bottles in their windows, was first placed immediately in front of the lens. With an exposure of six seconds a perfect negative was obtained. This exposure was about double that required when the coloured solution was removed.

"2nd. A similar bath was used, containing a green solution of chloride of copper. With an exposure of twelve *minutes* not the slightest trace of a negative was obtained, although the image was clearly visible upon the ground-glass. It was, therefore, found advisable to dilute the solution considerably; and by doing this, and making the green tinge of the water *very* much paler, a tolerable negative was eventually obtained in twelve minutes.

"3rd. A sheet of lemon-coloured glass was next placed in front of the lens, and a good negative obtained with an exposure of two minutes.

"4th. A plate-glass bath, similar to the others, and containing a strong red solution of sulpho-cyanide of iron was next used, and a good negative obtained with an exposure of eight minutes.

"It is impossible to describe in words the exact shades of colour, or intensity of these solutions. The thickness of the fluid through which the light had to pass was about three-quarters of an inch. The collodion was simply iodized, the bath neutral, and the developer pyrogallic acid. The chemicals were in a highly-sensitive state, and good working order, producing clean and dense negatives, free from stains and streaks in all cases.

"The negatives taken in the manner described were printed by the tannin process upon glass, and exhibited as transparencies. The picture taken through the red medium was at the lecture illuminated by red light,—that through the blue medium, by blue light,—that through the yellow medium, by yellow light, and that through the green medium, by green light;—and when these different-coloured images were superposed upon the screen, a sort of photograph of the striped ribbon was produced in the natural colours."

Mr. Sutton concludes from these experiments that yellow glass is not so good for the windows of dark rooms, &c., as red or green glass. This idea would scarcely accord with the results the spectroscopic analysis of various-coloured glasses recorded in our "Scientific Gossip." Red glass, of some kinds, is found indeed to be quite impervious to actinic light; but the colour is so irritating to a sensitive eye as to be practically useless. The resistant power of green to the passage of the actinic rays is strikingly shown in the experiment narrated; but it can scarcely be assumed, as following, that green glass would necessarily have a similar effect. Green we know is, at least often, formed of a mixture of blue and yellow, and in such proportion as blue may be present, it may be expected to possess an actinic character. It will be seen, from the spectroscopic examination of a piece of green glass, that it is, in one instance at least, comparatively speaking, worthless for the purposes of the dark room. If we rightly understand the statement of the case, moreover, it was lemon-coloured, and not a deep yellow, or orange-coloured glass which was used in these experiments, and it might be expected *à priori* to permit of the passage, to a large extent of actinic light. The subject is very interesting, and we commend it to the attention of our readers, as also the following abstract of Professor Maxwell's lecture which we extract from the *Notes* to which the Professor had contributed it:—

"The speaker commenced by showing that our power of vision depends entirely on our being able to distinguish the intensity and quality of colours. The forms of visible objects are indicated to us only by differences in colour or brightness between them and surrounding objects. To classify and arrange these colours, to ascertain the physical conditions on which the differences of coloured rays depend, and to trace, as far as we are able, the physiological process by which these different rays excite in us various sensations of colour, we must avail ourselves of the united experience of painters, opticians, and physiologists. The speaker then proceeded to state the results obtained by these three classes of enquirers, to explain their apparent inconsistency by means of 'Young's Theory of Primary Colours,' and to describe the tests to which he had subjected that theory.

"Painters have studied the relations of colours in order to imitate them by means of pigments. As there are only a limited number of coloured substances adapted for painting, while the number of tints in nature is infinite, painters are obliged to produce the tints they require by mixing their pigments in proper proportions. This leads them to regard these tints as actually compounded of other colours, corresponding to the pure pigments in the mixture. It is found that by using three pigments only we can produce all colours lying within certain limits of intensity and purity. For instance, if we take carmine (red), chrome (yellow), and ultramarine (blue), we get by mixing the carmine and the chrome all varieties of orange passing through scarlet to crimson on the one side, and to yellow on the other. By mixing chrome and ultramarine we get all hues of green, and by mixing ultramarine with carmine we get all hues of purple, from violet to mauve and crimson. Now these are all the strong colours that we ever see or can imagine, all others are like these, only less pure in tint.

"Our three colours can be mixed so as to form a neutral grey, and if this grey is mixed with any of the hues produced by mixing two colours only, all the tints of that hue will be exhibited, from the pure colour to the neutral grey. If we could assume that the colour of a mixture of different kinds of paint is a true mixture of the colours of the pigments, and in the same proportion, then an analysis of colour might be made with the same ease as a chemical analysis of a mixture of substances.

"The colour of a mixture of pigments, however, is often very different from a true mixture of the colours of the pure pigments. It is found to depend on the size of the particles, a finely-ground pigment producing more effect than one coarsely ground. It has also been shown by Professor Helmholtz, that when light falls on a mixture of pigments, part of it is acted on by one pigment only, and part of it by another, while a third portion is acted on by both pigments in succession before it is sent back to the eye. The two parts reflected directly from the pure pigments enter the eye together, and form a true mixture of colours, but the third portion, which has suffered absorption from both pigments, is often so considerable as to give its own character to the resulting tint. This is the explanation of the green tint produced by mixing most blue and yellow pigments.

"In studying the mixture of colours we must avoid these sources of error, either by mixing the rays of light themselves, or by combining the impressions of colours within the eye by the rotation of coloured papers on a disc.

"The speaker then stated what the opticians had discovered about colour. White light, according to Newton, consists of a great number of different kinds of coloured light, which can be separated by a prism. Newton divided these into seven classes, but we now recognise many thousand distinct kinds of light in the spectrum, none of which can be shown to be a compound of more elementary rays. If we accept the theory that light is an undulation, then, as there are undulations of every different period from the one end of the spectrum to the other, there are an *infinite* number of possible kinds of light, no one of which can be regarded as compounded of any others.

"Physical optics does not lead us to any theory of three primary colours, but leaves us in possession of an infinite number of pure rays with an infinitely more infinite number of compound beams of light, each containing any proportions of any number of the pure rays.

"These beams of light passing through the transparent parts of the eye fall on a sensitive membrane, and we become aware of various colours. We know that the colour we see depends on the nature of the light, but the opticians say there are an infinite number of kinds of light, while the painters, and all who pay attention to what they see, tell us they can account for all actual colours by supposing them mixtures of three primary colours.

"The speaker next drew attention to the physiological difficulties in accounting for the perception of colour. Some have supposed that the different kinds of light are distinguished by the time of their vibration. There are about 447 billions of vibrations of red light in a second, and 577 billions of vibrations of green light in the same time. It is certainly not by any mental process of which we are conscious that we distinguish between these infinitessimal portions of time, and it is difficult to conceive any mechanism by which the vibrations could be counted, so that we should become conscious of the results, especially when many rays of different periods of vibration act on the same part of the eye at once.

"Besides, all the evidence we have on the nature of nervous action, goes to prove that whatever be the nature of the agent which excites a nerve, the sensation will differ only in being more or less acute. By acting on a nerve in various ways, we may produce the faintest sensation or the most violent pain; but if the intensity of the sensation is the same, its quality must be the same.

"Now we may perceive by our eyes a faint red light which may be made stronger and stronger till our eyes are dazzled. We may then perform the same experiment with a green light or a blue light. We shall thus see that our sensation of colour may differ in other ways, besides in being stronger or fainter. The sensation of colour, therefore, cannot be due to one nerve only.

"The speaker then proceeded to state the theory of Dr. Thomas Young, as the only theory which completely reconciles these difficulties, in accounting for the perception of colour. Young supposes that the eye is provided with three distinct sets of nervous fibres, each set extending over the whole sensitive surface of the eye. Each of these three systems of nerves when excited gives us a different sensation. One of them, which gives us the sensation we call red, is excited most by the red rays, but also by the orange and yellow, and slightly by the violet. Another is acted on by the green rays, but also by the orange and yellow, and part of the blue, while the third is acted on by the blue and violet rays. If we could excite one of these sets of nerves without acting on the others, we should have the pure sensation corresponding to that set of nerves. This would be truly a primary colour, whether the nerve were excited by pure or by compound light, or even by the action of pressure or disease.

"If such experiments could be made, we should be able to see the primary colours separately, and to describe their appearance by reference to the scale of colours in the spectrum. But we have no distinct consciousness of the contrivances of our own bodies, and we never feel any sensation which is not infinitely complex, so that we can never know directly how many sensations are combined when we see a colour. Still less can we isolate one or more sensations by artificial means, so that in general, when a ray enters the eye, though it should be one of the pure rays of the spectrum, it may excite more than one of the three sets of nerves and thus produce a compound sensation. The terms simple and compound, therefore, as applied to colour sensation, have by no means the same meaning as they have when applied to a ray of light.

"The speaker then stated some of the consequences of Young's theory, and described the tests to which he had subjected it.

"1st. There are three primary colours.

"2nd. Every colour is either a primary colour or a mixture of primary colours.

"3rd. Four colours may always be arranged in one of two ways. Either one of them is a mixture of the other three, or a mixture of two of them can be found identical with a mixture of the other two.

"4. These results may be stated in the form of colour equations giving the numerical value of the amount of each colour entering into any mixture. By means of the colour top such equations can be obtained for coloured papers, and they may be obtained with a degree of accuracy showing that the colour-judgment of the eye may be rendered very perfect.

"The speaker had tested in this way more than one hundred different pigments and mixtures, and had found the results agree with the theory of three primaries in every case. He had also examined all the colours of the spectrum with the same result. The experiments with pigments do not indicate what colours are to be considered as primary, but experiments on the prismatic spectrum show that all the colours of the spectrum, and therefore all the colours in nature, are equivalent to mixtures of three colours of the spectrum itself, namely, red, green, and blue. Yellow was found to be a mixture of red and green.

"The speaker, assuming red, green, and blue as primary colours, then exhibited them on a screen, by means of three magic lanterns, before which were placed glass troughs containing respectively sulpho-cyanide of iron, chloride of copper, and ammoniated copper. A triangle was thus illuminated, so that the pure colours appeared at its angles, while the rest of the triangle contained the various mixtures of the colours, as in Young's triangle of colours. The graduated intensity of the primary colours in different parts of the spectrum was exhibited by three coloured images, which, when superposed on the screen, gave an artificial representation of the spectrum.

"Three photographs of a coloured riband, taken through the three coloured solutions respectively, were introduced into the camera, giving images representing the red, the green, and the blue parts separately, as they would be seen by each of Young's three sets of nerves separately. When these were superposed, a coloured image of the riband was seen, which, if the red and green images had been as fully photographed as the blue, would have been a truly-coloured image of the riband. By finding photographic materials more sensitive to the less refrangible rays, the representation of the colours of objects might be greatly improved.

"The speaker then proceeded to exhibit mixtures of the colours of the pure spectrum. Light from the electric lamp was passed first through a narrow slit, a lens, and a prism, so as to throw a pure spectrum on a screen containing three moveable slits, through which three distinct portions of the spectrum were suffered to pass. These portions were concentrated by a lens on a screen, at a distance forming a large uniformly-coloured image of the prism. When the whole spectrum was allowed to pass, this image was white, as in Newton's experiment of combining the rays of the spectrum. When portions of the spectrum were allowed to pass through the moveable slits, the image was uniformly illuminated with a mixture of the corresponding colours. In order to see these colours separately, another lens was placed between the moveable slits and the screen. A magnified image of the slits was thus thrown on the screen, each slit showing, by its colour and its breadth, the quality and quantity of the colour which it suffered to pass. Several colours were thus exhibited, first separately and then in combination. Red and blue, for instance, produced purple; red and green produced yellow; blue and yellow produced a pale pink; red, blue, and green produced white; and red and a bluish-green produced a colour which appears very different to different eyes.

"The speaker concluded by stating the peculiarities of colour-blind vision, and by showing that the investigation into the theory of colour is truly a physiological enquiry, and that it requires the observations and testimony of persons of every kind, in order to discover and explain the various peculiarities of vision."

THE PARADOX OF THE SOLAR SPECTRUM.

BY S. D. TILLMAN, A.M.*

An apparent anomaly in the solar spectrum has heretofore been the subject of discussion before this Society. A further elucidation of it is the object of the present paper. The generally accepted undulatory theory of light is commended for its simplicity in referring all luminous calorific and actinic effects to the action of a single all-pervading imponderable fluid.

The undulations of ether or eeth-waves in their length and velocity have a direct relation to the heating and chemical power of the sunbeam. Heat is found in maximum beyond the red ray of the solar spectrum, and in minimum beyond the violet ray, decreasing regularly from the red to the violet while actinism acts inversely. The heating power being directly as the length of the wave, and the actinic power directly as the velocity of the wave. The luminous power, on the contrary, seems to obey the heat-law from the red to the yellow, the actinic law from the yellow to the blue, and again the heat-law from the blue to the violet, in other words, both the most and least luminous rays are found within the extremities of the solar spectrum. Thus, while light is said to depend upon undulations, paradoxical as it may appear, the degree of luminosity has no relation in reality to a regular increase in the length or the velocity of such undulations. Another phenomenon, involving an apparent paradox, is found in the union of the primary series of waves; if to the yellow ray, the most luminous of the spectrum, is added the red, a darker ray, and the blue, a still darker ray, the resultant is white light.

In the sunbeam, when decomposed by the prism, the arrangement of colours and the degrees of luminosity bear a marked analogy to order of concords of sound. The eye and ear, although differing widely in their capacity to receive the impression of wave forces, exercise similar offices in conveying to the mind the mysterious influence arising from harmony. Fortunately this similarity in the effects of light and sound will enable us to illustrate the action of the former by the latter in statements of proportions where high numbers and intricate diagrams would tend to confuse rather than enlighten.

The brilliancy of the yellow ray of the spectrum and of the mediant chord in the septave arises from the fact that the waves producing them have remarkable harmonic relations with the remainder of the series. If the number of waves producing the tonic or fundamental sound be taken at 24, that for the mediant will be 30, and that for the dominant will be 36. The sum of the tonic and dominant waves (corresponding with the red and blue rays) is just double the number of waves producing the mediant which corresponds with the yellow ray. The sum of all the waves causing the septave series of sounds, excluding the tonic, is found to be 210 or just seven times 30, the number belonging to the mediant.

The sound corresponding with the darkest ray is the submediant, it has no such relations with other sounds as belong to the brilliant mediant, except in the case where the subdominant becomes the tonic, and it then is the mediant of the new modulation, showing clearly that it is *the relations*

* Read before the American Photographical Society, June 10, 1861.

of pitch and not the pitch itself which produce these peculiar effects.

If the tonic is taken as 1, its octave will be 2, and the ratios expressing the other sounds of the septave will have one term which is a multiple of the prime number 2 with the exception of the peculiarly depressing sound known as the relative minor tonic whose ratio with the major tonic is expressed by the higher prime numbers 3 and 5. Thus while the tonic and its octave which produce the most perfect harmony are represented by the increase of the unit by geometrical progression, all other chords will produce effects proportional to their ratios. So, likewise, luminosity in degree depends not on actual but relative velocities of vibration.

The musician may vary the expression of his composition by the *timbre* of his instrument and by the intensity of sound, yet the latent and lasting power of the melody lies in the arrangement of sounds, that is, in the sequence of ratios. So also the painter produces most striking and permanent effects, not by the presence or absence of luminosity as measured from a fixed standard by the *harmonic relations* of colours which like those of sound may be expressed in numerical ratios, thus resolving all effects through the eye into resultants of a sequence of velocities each of which may be represented by a definite mathematical expression.

BOTTLES EXPLODING.

A singular circumstance is related in a recent number of the *American Journal of Photography* under the head of "Explosion of a collodion bottle," in which the writer is at considerable pains to show that the explosion was due to the bottle itself, and did not arise from any expansion or vapourising of the collodion. The bottle was of glass, and contained two gallons of collodion, which had stood for a week when the explosion took place.

"While everything in the room was perfectly quiet we heard such a sound as about a cubic foot of water let drop all at once (not poured) from a small height would make, accompanied at the same time with the smashing of about a gross of wine glasses. My first impression was that a tank of croton,* in the room above us, had come in a deluge on my chemical apparatus. But an immediate odour of ether, and a river of collodion flowing across the floor, shewed at once that my bottle of fine collodion was smashed, and that we were in danger of our lives. I ordered all the windows to be opened at once, leaped to the story below to put out any fire which might be burning there; but luckily it was a warm day and no fire was burning in the building. We were safe.

"We scooped and wiped up the thickening collodion on the floor, and then began to speculate on the cause of the phenomena. We established in the first place that the expansion of the collodion vapours did not explode the bottle; I am always careful to guard against accident from that cause, and the cork, which we found, was conclusive against such a theory. Nothing could have fallen on to the bottle, or have been thrown against it. The cause of the accident must be sought not in the contents of the bottle, not in the bottle nor in anything outside of it, but in its very substance. This reasoning and conclusion were but reached in a hurry. My friend Thornbrook, and I, before we were prepared to adopt it, gave the whole case careful scrutiny, and discoursed profoundly of our former experience and the teachings of books. While we were thus talking, half-a-dozen assisting, another thing happened which was quite as unexpected and mysterious as the original disintegration of the bottle.

"The bottom of the bottle entire, still lay on the table and had not been touched. It apparently had not been touched in a week. We were all standing around the table as above described, when we heard a sharp crack, precisely like an explosion of a percussion cap, and at the same time, a thin slice from the upper rim of the bottle keeled away over on to the table. This fragment was in average about one-third inch thick, and was about two-thirds of a complete ring. The surface of fracture was exceedingly uniform grooved, curved and polished, as if it had been the handiwork of an artist; indeed, it was suggested that the bottle had been joined together in a series of ground rings.

"The simple statement of the case seems to be, that a glass bottle, quietly standing, went to pieces, and that this is a very strange accident. If it had been an unannealed bottle, or if it had just come out of a store, I would not think so much of it. But it was a favourite bottle, which I had used for years, and I had got it at first from a photographer who had used it for a long time before."

In a subsequent number of the same journal Mr. Coleman Sellers, one of its most intelligent contributors, gives an interesting explanation of this curious fact, from which our readers may learn something. He remarks:—

"The marvellous stories of the feats of eastern jugglers, as told by eye witnesses, impress us with wonder, and we can find no solution of these mysteries, simply because we have not heard the whole story; the attention of the narrator was drawn away from the important movements by some by play, and what he did not see, is not, of course, related to us. So with the troubles of photographers, they detail all they have done in some cases, and the routine of their operations seeming right, they wonder at their failure. Some little act of careless omission or commission, is neglected and we can do nothing to help them in their trouble.

"Not so, however, with the explosion of the collodion bottle so pleasantly told in the last number of this journal, (and most sincerely do I sympathise with the author); he tells all the story in saying, "I spent about twenty minutes on the bottle, assisted with a *bottle-brush*, water, and alcohol." Here was the rub; that bottle-brush was most likely the criminal. It was perhaps made of wire twisted, having projecting bristles; the wire was doubtless iron, and may be a very little rusty. Glass is a very ticklish substance, and don't like to be scratched inside. If any of my readers would try the experiment, they can convince themselves of this fact by the following. Through a clean glass tube, new or old it matters not which, let them then draw an iron wire just a little rusty; then let them lay the tube away in a drawer, under lock and key. It now will be only a matter of time when that tube shall go into a thousand pieces spontaneously,—but go it will most assuredly, if not in a few days, in a few weeks, but often in a few hours.

"It is a well-known fact that if the inside of a glass tube be touched by a rough iron wire it will be scratched, and that scratch, though ever so slight, will be the starting point from which the disintegration of the tube will radiate; and the fraction is always in rings, and of a conchoidal form. The writer was many years ago speaking of this to Dr. John Locke, of Cincinnati. The Doctor related many amusing anecdotes illustrative of the fact, and said that it was his rule in cleaning glass tubes, to drop through the tube a lead plummet attached to a sink cord through an eye in this plummet, he would then assist the cotton cloth to be drawn back through the tube, thus cleaning it.

"The same in relation to bottles, he would use no iron wire in cleaning either. Glass, no matter how well annealed, is always under some strain, and is more liable to break from an internal than from an external scratch.

"An experiment illustrating this is often shown in glass works, a tumbler cooled in the air, is placed bottom up on a board, over it some sand could be thrown with impunity, but when a few grains of the same sand are dropped inside of the glass it will at once fly into countless pieces. Let, therefore, the explosion of that collodion bottle in New York, be a warning to all who take to the bottle in a legitimate way, never to tickle its inside with an iron wire, for it surely will laugh itself to pieces and to the consternation of the innocent operator."

Dictionary of Photography.*

Pyroxyline.—*continued.*—The parchmentized soluble cotton, obtained by the use of a large excess of sulphuric acid, does not possess the physical properties usually considered desirable in a collodion intended for the dry processes. Amongst the essentially necessary conditions for a dry collodion, a pyroxyline yielding a powdery porous film has generally been considered important, on the ground that it is more easily permeable by aqueous developing solutions, and less

* Water from the Croton aqueduct.

* Continued from p. 352.

apt to blister or leave the glass. To secure a pyroxyline yielding such a film, various methods have been proposed. Mr. Hardwich has suggested immersing for a few seconds the parchmentized pyroxyline already described, in nitro-sulphuric acid, mixed in the inverse proportions to that with which it was made, or three parts of nitric acid, sp. gr. 1·450 and one part of sulphuric acid, at a temperature of 150°. The operation of these acids upon the tough pyroxyline is to render it rotten and powdery in texture, and to make it give a porous permeable film with considerable tendency to density of image. The action of alkalies on pyroxyline has also a tendency to cause a rotten film. To produce this effect it is added to the plain collodion.

The formula we have given, as propounded by Mr. Hardwich, although unquestionably producing a collodion possessing many desirable characteristics, has a tendency, if the greatest precision be not observed in all the conditions, to cause entire dissolution of the cotton in the acids, and is scarcely suitable for the use of amateurs or others not intending to enter commercially into the manufacture of pyroxyline. We shall now proceed, therefore, to describe a method which has been universally successful in our own hands, and the appliances for which are simple and easily acquired.

Procure, in the first place, an earthenware jar, holding about a pint, and a deep earthenware dish, within which the jar can stand. Also procure a couple of stout glass rods about twelve inches long, a couple of glass spatulas the same length, and about an inch broad, will answer still better. Have also ready a kettle of boiling water and a pail of cold water. Now take of nitric acid sp. gr. 1·420 three measured ounces, and of sulphuric acid sp. gr. 1·840 three measured ounces, and put them into the pint jar which is standing in the larger dish. In this larger dish pour the boiling water so that it may surround the sides of the jar containing the acids. The temperature of the acids will rise when they are mixed, but probably not sufficiently, and it must be raised by means of the hot water in the outer vessel until it reaches 150° Fah. The cotton, which should be the best sample procurable, well carded and free from all impurities, should have been prepared previously; a quarter-of-an-ounce is the proper proportion for the quantity of acids named. It should be separated into tufts, well pulled out, into about the size of a penny piece. These should be immersed in the acids, at the temperature stated, one at a time, and pushed quickly down into the acids, with the glass rod, and pressed against the side of the jar. The whole should be as rapidly immersed as possible, care being taken to prevent it rising above the surface of the acids, and so coming into contact with the atmosphere, which would endanger the formation of red nitrous fumes and the entire dissolution of the cotton. When all the cotton is immersed, a plate of glass may be placed on the top of the jar to prevent the acids from cooling, and the whole left for ten minutes.

Now seize the whole of the cotton between the glass rods, and pressing out as much of the acids as possible, quickly pass it into the pail of water which has been provided beforehand for the purpose, and quickly stir the cotton about so as to distribute it rapidly through the water. If care be not taken in this respect, the acids left in the cotton being diluted with the water, it occasionally happens that the whole of the cotton is dissolved at this stage. It should, therefore, be as rapidly as possible pulled from together, and distributed through the whole pail of water to stop as quickly as possible the effect of the acids. In a few minutes the water should be changed, and so for a quarter-of-an-hour, giving not less than half-a-dozen changes of water during that time. It should then be placed under a stream of turning water for a few hours, after which, if a piece of blue litmus paper remain unchanged in the water, the cotton is sufficiently washed. In some cases, where time is an object, a few drops of strong ammonia may be added to one of the final washing waters, after which wash well with rain water. Some authorities have objected to the use of ammonia for neutralising any traces of acid remaining after long washing, but after considerable experience in its use, we have never found any disadvantage arising from it.

After the cotton is thoroughly washed it should have the water wrung from it, and be pulled out so as to be as open as possible, and spread upon a large sheet of paper to dry. This may be done spontaneously in a warm place, or it may be more quickly effected by the aid of a water bath. It should on no account be placed in an oven, on the hob, or, indeed, in any place near a fire, as we have in many cases known explosions, which might have been attended with serious consequences, result from such modes of drying. Where a small quantity for immediate use is required to be dried quickly, it may, after pressing as much water as possible, be immersed in alcohol which will absorb the remaining water, and it will then on pulling out, rapidly dry. When the washing is completed the best mode of getting rid of as much water as possible, is to place the cotton in a clean napkin, and then wring it thoroughly until not another drop of water can be pressed out of it.

The pyroxyline produced by the formula we have just described ought to be somewhat short, but not rotten in texture. Not entirely explosive, but burning rapidly, just on the point of explosion, and leaving no ash. It should dissolve entirely in a mixture of equal parts of ether and alcohol, and give an even somewhat tough film, and thus present physical properties suitable for either positives or negatives.

For the convenience of those who may have difficulty in obtaining nitric acid of the strength we have named, we may state that the specific gravity of the nitric acid usually sold as "pure nitric acid," without any statement of its strength, generally contains more water than that we have named, and very commonly possesses a specific gravity of 1·360. With nitric acid of this strength, and the oil of vitriol of commerce as the sulphuric acid, the proportions should be in the ratio of six measured ounces of the latter to four measured ounces of the nitric acid. This at a temperature of 150° will give a very excellent cotton, perhaps a little shorter, and more suited to negative purposes than the former, but dissolving perfectly, and giving an even structureless film adhering well to the glass. In both cases the increase in weight will be from thirty to fifty per cent.

Where a pyroxyline solely for positive purposes is required, the temperature might with advantage be reduced to 140° or 135°. The result of which would be a little less intensity in the character of the image given, a little more transparency in the shadows, and more silvery whiteness in the image by reflected light.

Where pyroxyline is made with acid containing a little more water, or at a higher temperature, or with both conditions, the cotton becomes shorter and more powdery in texture, gives a thinner and more textureless film, which is somewhat porous in character, and at a certain stage acquires the quality of forming, to a certain extent, an organic compound with silver, which causes it to give a very intense image. It is to be understood that weaker acids, at the same temperature, or the same acids at a higher temperature, would in either case produce similar results. That is weak acids at a moderate temperature, or stronger acids at a very high temperature each tend to the production of a cotton giving, in collodion, a powdery film and somewhat intense image. The best mode of securing this end, therefore, is by a judicious combination of the two means thus presented. Thus with acids of the same strength, the temperature may be gradually increased up to 160° or even 180°, and at the same time additions of water, made at the rate of from half-a-drachm to a drachm at a time, for each fresh batch of cotton made, until a cotton of the desired quality, suitable for dry, or other purposes requiring the organic character, be obtained. The point to be guarded against when the maximum of water has been added, and the maximum of heat obtained, is the entire solution of the cotton in the acids, and the evolition of red nitrous fumes.

Other substances besides cotton wool have been used for the manufacture of pyroxyline, such as linen, flax, paper, &c., but cotton wool has been found to answer general purposes much the best. Paper has, indeed, been frequently commended as giving a more fluid, structureless, and intense collodion than the pyroxyline made from cotton wool. Against this it has been very justly urged that paper is a mixed and uncertain compound, and can never be guaranteed to be twice exactly the same article. Notwithstanding this argument, many photographers prefer its use; and we are bound to add that in our hands many traits of its excellent character have been fully exemplified, and a pyroxyline, possessing all the most desirable characteristics for a negative collodion, has been the result of its use. Good white blotting paper, or that known as Swedish filtering paper, is the most suitable for the purpose. It should be cut into strips about half-an-inch wide, and crimped a little to cause it to lie loosely in the acids, and allow them to surround it properly. The formula and manipulations are, in other respects, the same as for cotton.

It is desirable for the amateur and novice not to work with too large a quantity of material at one time. The quantity we have mentioned, a quarter of an ounce of cotton, making nearly three drachms of pyroxyline, is quite sufficient for convenient manipulation, and when larger quantities are tried, the risk of failure from various causes is much increased.

It is desirable for the manipulator to wear, during these operations, india-rubber gauntlets, to protect the hands and wrists both from the fumes and splashes of the acids. The fumes alone are apt to colour the fingers and nails of a disagreeable yellow tint, which cannot be readily removed, whilst any splashes falling on the skin are very corrosive, and quickly produce serious wounds. Great care should be used to avoid splashes at all, as of course the clothes or any other fabric on which the acids may fall will inevitably be destroyed in such places.

It is always desirable that the operation be conducted under a chimney, where there is a good draught of air, so as to convey away any fumes which may arise; or, it may be conducted in the open air, the manipulator standing to windward. The ordinary vapours of the nitrosulphuric acid are neither pleasant nor wholesome, and should be carefully avoided. Should the red nitrous fumes be evolved during the operation, the first effort should be to stop the progress, by punching down the part, from which they arise, into the acids. Should it be found impossible to arrest the progress, it will be better to leave the apartment at once, leaving open the door and window, risking the loss of the pyroxyline rather than the loss of life, which might be the consequence of breathing these deadly fumes.

Pyroxyline should be kept in a dry place and in the dark, a tin box with a loose fitting cover answering the purpose for keeping it admirably.

(*To be continued.*)

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 7th August, 1861.

Another revolution in photography! The honour of achieving this result is due to Sig. Joseph Eugéne Balsamo, Professor of Natural Philosophy at Lecca, in Italy, who has found a substitute for nitrate of silver in positive printing, which is hydrochloric acid saturated with phosphorus, and diluted with acetate of copper. Paper imbued with this compound is exposed to the action of light under a negative, and when it has acquired a gray colour, it is removed from the pressure-frame and exposed for five minutes to the vapours of sulphuretted hydrogen, which acts upon those parts of the paper which have become altered by the action of light. The picture is afterwards toned and fixed in a solution of nitrate of bismuth. A decomposition of the salt of copper takes place, and the image, which is permanent is formed of oxide of bismuth. The professor, with that true liberality which characterizes men of science, has given his discovery to the world, His researches in heliography have opened a new path to the photographer, and he promises another communication on this subject ere long.

I can almost chronicle even another revolution in photography, in which collodion sensitized with nitrate of silver will be dethroned; but what the new photogen consists of I am at present unable to say. But its discoverer, M. Gaudin, is one not prone to rash assertions, therefore we may look hopefully to the result of his experiments to the attainment of the result indicated. Of this result he speaks most confidently, and it is to be hoped that he will not withhold the information so long as to render his reticence tantalizing.

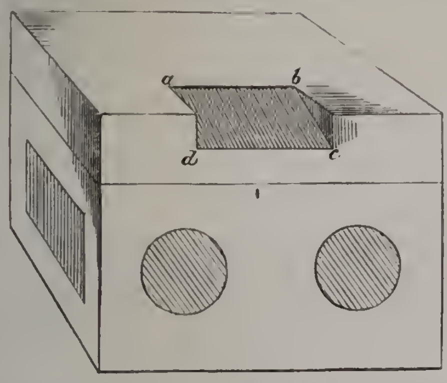
M. Gaudin, commenting on Mr. Barber's paper on "a new method of preparing pure nitrate of silver by means of alloys of silver and copper," remarks, that a nitrate of silver rendered blue by the presence of copper would be unsaleable, while a nitrate of silver adulterated and whitened with the salts of potash finds ready acceptance, and yet, nothing is less certain than the presence of copper in the nitrate being injurious, while from what has often occurred to M. Gaudin, he strongly suspects that the presence of copper is quite advantageous than otherwise. For whenever he prepared nitrate of silver from silver coin, without completely separating the copper, he always found the nitrate of silver to possess a remarkable sensibility, which he estimates to be not less than four times the sensibility of pure nitrate of silver. But whether he made the comparison between a good cupreous nitrate of silver, and an adulterated commercial nitrate, he is unable to state, so that the question of the superiority of cupreous nitrate must remain open, until it has been strictly tested. At present, however, M. Gaudin does not hesitate to say that every photographer who gives himself the trouble to remove all traces of copper from his nitrate of silver, is guilty of a piece of gratuitous folly; for it is certain, that the presence of nitrate of copper cannot be more injurious than all the other nitrates formed in the bath while in use, while it may prove to be a great accelerator; for the iodide of copper is insoluble, and when a plate is sensitized iodide of silver and iodide of copper are both formed on the collodion film; and as in photography rapidity is always due to the addition of foreign bodies in minute quantities, copper, thus far, appears to present all the characteristics of an accelerating agent.

Still another revolution in photography! Mr. Wothly, of Aix-la-Chapelle, writes under date of 27th ultimo, that after many years of research, he has succeeded in obtaining positive portraits without nitrate of silver, or chloride of gold, or carbon, or hyposulphite of soda, in a word, without any of the photographic agents usually employed. They are replaced by a simple chemical preparation, much more sensitive than nitrate of silver, which renders all retouching unnecessary when the negative is free from defects. All his positives from *carte de visite* to the life-size, have a striking appearance; the modelling is of exquisite delicacy and the tones are as brilliant as can be desired. The manipulation remains the same; every photographer can perform it without any difficulty, with this great advantage, that he can deliver his portraits within two or three hours after the sitting. The new photographs are indestructible; they will endure as long as the paper upon which they are printed, and are 95 per cent. cheaper than those produced by the present method. This is marvellous; but we withhold our credence for ocular demonstration.

Apparatus.

DEVELOPING BOX.

Sir,—Seeing in a recent number of the News a notice of a dark box by "C. S." I forward you one that I have in use. Its dimensions are 2¼ ft. by 1½ ft. by 1½ ft. deep. There is a square piece out of the back 7½ by 6½ inches, the bottom of which is 3¼ inches from the bottom edge of the box. I have it thus low in order that the plate when developing may be right between it and the glass *a*, *b*, *c*, *d*. I find it



far better to have the piece *a*, *b*, *c*, *d*, as represented in the diagram, than inserted in the horizontal plane of the lid. The lid is 3 inches deep; the glass *a*, *b*, *c*, *d*, is 7 by 4 inches. The side holes are 6 inches square, common glass, on the inside of which I have pasted three thicknesses of red tissue paper; all three vertical windows have curtains inside, the window at the back having yellow paper instead of red. The wood cut out of the lid fits in with a button for travelling. The front holes are 7 inches diameter and 7 inches apart. The whole is painted *white* to throw off the rays, and thus to keep the inside cool. I use for developing a black cloth tied round my neck and lined with white, so that when in action the white is outermost and keeps the head cool of Your obedient servant,

J. C. B.

P. S.—Round the front holes I have nailed black cloth, with two pieces of elastic on *each* to fit the arm. The box holds all chemicals and two cameras. The whole goes on to a small wheelbarrow.

A SIMPLE DARK TENT.

Sir,—As you say in you 143rd number that you will be glad to receive hints from any of your readers upon the subject of "tents," and as I am indebted to your useful paper for many valuable hints, I here give you, as a trifling acknowledgment, a description of a tent which was suggested to me by Dame Necessity some three or four years ago, whilst I was residing in the most distant settlement of of the British Colonies in the Pacific Ocean, Nanaimo, Vancouver's Island, where I had none of the advantages possessed by the readers of the Photographic News for the benefits to be derived from a knowledge of the experience of others, can only be fairly appreciated when the want of that knowledge is felt. As I left England soon after Mr. Archer's discovery of the collodion process was made known, I did not know of the existence of the Photographic News until some two or three months after my return home, in the last year (1860).

The construction of my tent is so simple that it may be made by the poorest mechanic, and its cheapness brings it within the reach of the poorest photographer, as it need not, I think, cost more than 5s. or 6s. besides his own trouble in making it.

I first took three rods of deal, each about 8 feet in length and 1½ inches square; within an inch of the one end of each I made a small hole, I then passed through each of these holes a piece of strong wire, the two ends of which I twisted together, thereby making it into a ring, but of sufficient size as to allow a free action of the deal rods, which now hung upon it in the same manner as the ribs of an umbrella hang upon the wire ring at the end of the handle. I then erected it upon its feet in the shape of a tripod-stand, and as I could not there obtain either "yellow calico," or "yellow tammy" I covered it with *white* calico, which I afterwards painted "yellow," leaving an entrance upon the one side, over which I placed a loose curtain of the same material. My tent I usually carried upon my shoulder, and my apparatus, &c., in a light box, which latter, when emptied of its contents, I used to put inside my tent, and thus made it serve as a rather low operating table. In this tent almost any sized plate may be manipulated upon.

I have enclosed a print from a negative developed in said tent.—I am, sir,

A Pupil of a Californian Photographer.

June 15, 1861.

WOODEN SILVER-BATHS.

We have recently tried one of the wooden silver-baths, intended especially for use in tents and developing boxes, made by Mr. Francis, of Great Russell Street. The bath is made of deal, and furnished with a water-tight top; instead of being coated inside with a varnish of shellac, it is lined throughout with thin sheet india-rubber, which passes through between all the joints. Instead of being glued together it is screwed, the india-rubber serving as an elastic washer, and causing it to fit perfectly, without a chance of leakage. It answers the purpose perfectly, being at once light, rigid, and free from the risk of breakage. Pure india-rubber is without action on the solution of nitrate of silver, and may be used safely. It may be as well to add that india-rubber, for such a purpose, should be kept in the dark, as it corrodes under the combined influence of light and moisture, although quite unacted on by moisture alone.

Photographic Notes and Queries.

Stereo-Exchange Club.

Sir,—I am acquainted with several members of the Stereo-Exchange Club, and without exception they express more or less dissatisfaction with its working, complaining that they often receive a worse samplo of pictures than they send, want of interest in tho subjects, &c. They themselves do not appear to be altogethor clear of blame, as they admit that after boing "done" once or twice, they are, to say the loast, not so careful as to what they send out in return themselves.

As I think the club might be of very great interest and advantage to stereo-photographers, I beg to offer a few suggestions which would, I think, if carried out, give a guaranteo for the quality, and allow of mombers selecting their subjects.

I proposo:—That some practical photographer, in whoso judgment the members would have confidenco, bo appointed secretary, to whom all prints intended for exchange should be forwarded, each accompanied with a penny stamp to defray tho expenses of working, the balance to remain with the secretary as some compensation for his trouble.

That the secretary should arrange the prints received into three classes, according to quality, say "good," "medium," "indifferent," forwarding to the member who has contributed them a ticket, in return for which he can claim from the club an equal number of the samo qualities.

That when a sufficient number are on hand, a list of the subjects arranged under their different qualities should be sent to each member to select from, the prints being returned to him by post at tho expense of the society in exchango for his tickets.

Of course minor details would requiro arranging, I merely offer these hints to give an idea of a system of management which I think would be satisfactory in its results.—Yours, &c.,

Stereo.

Wigton, August 3, 1861.

Talk in the Studio.

Photolithographic Processes.—We omitted, in a recent notice of Mr. Ramage's photolithographs, to mention the fact, which may interest some of our readers who are engaged on similar experiments, that he had forwarded to us a specimen of grained ground, of a very fine dotted or stippled character, printed on a thin sheet of gelatine paper, and intended for transfer on to the photolithographic stone. We also received at the same time a piece of a zinc plate, on which a photographic reproduction of an engraving was "bitten-in" by means of acids. We hope shortly to be able to give some details of Mr. Ramage's experiments in this interesting direction.

Mr. James Sant, whose exquisite paintings of children every lover of art is familiar with, was recently elected an Associate of the Royal Academy.

The Exhibition of 1862.—Her Majesty's Commissioners have arranged the principles and general details of the Catalogues for the Exhibition of 1862. Three catalogues will be issued: an "Industrial Catalogue," an "Illustrated Catalogue," and a "Fine-Art Catalogue." All matters of a general kind intended for insertion must be sent in to the secretary before February 1; all advertisements before March 1. The price of the Industrial and Fine-Art Catalogues will be one shilling each. The Illustrated Catalogue, which will mainly concern the Exhibitors, though it will also have a present and permanent interest for the public of spectators, will be produced on a handsome scale, in super-royal 8vo., so as to range with the magnificent work of 1851. The name and address of each Exhibitor will be given, with a brief description of his contribution; the printing and paper of this part of the Catalogue being provided by the Commissioners. Detailed descriptions of articles and woodcut illustrations of them must be paid for by the Exhibitor. Editions of ten thousand copies will be struck off from time to time as they may be demanded by the public. All advertisements must first be submitted to Her Majesty's Commissioners.—*Athenæum.*

Improvement in Cameras.—The specification of an invention, by Mr. Hugh Mac Farlane of Glasgow, which received provisional protection only, describes the intended improvement in cameras as follows:—"This invention relates to improvements in cameras such as are used by photographers, such improvements whilst of a simple and inexpensive character permitting of a slight inclination being given to the picture plate, which is in many cases of great benefit, as is well understood by photographers. In a camera embodying the improvements the back portion of the box, instead of being as ordinarily rigidly fixed to the inner shell which is drawn out with the back, has such inner shell entered loosely a short distance and attached by a single screw or pin at the top, and another at the bottom, so that the back can be inclined slightly in either direction about a vertical axis. The back of the box can be fixed at any inclination by means of a screw working in connection with the guide in the back-supporting flap. A slight inclination about a horizontal axis is obtained by means of a pair of levers inside the box, against which levers the frame for holding the picture plate bears, these levers being inclined by means of pins projecting through slots to the outside, and being fixed by means of external screw nuts."

To Correspondents.

J. G. L.—The mode in which you can best apply blinds to your glass-room will depend entirely upon its construction, and can only be determined by personal inspection. It is desirable to possess a double set of blinds to every part of the room which is glazed. These should be divided into convenient sizes to allow of the light being cut off from any given part, whilst the rest is uncovered. The double set of blinds should consist of one set of white calico, and another of blue, either of which may be used alone, or both together. It would have been better to have had the glass at the north end; as your sitter must be under that end which is not glazed, and by your present arrangement he will be illuminated with a south light. The north light is much the best, as being so much more uniformly steady throughout the whole of the day, as well as being softer.

S. W.—The stereoscopic lens to which you refer is the very best we know for stereoscopic work, portrait and landscape. It is not intended to cover a quarter-plate, but will do so as well as most of the lenses sold as quarter-plate lenses.

Thomas Falconer.—It is purely a matter for experiment, but we have not had opportunity of trying it.

Alpha.—There are two or three modes of taking a building without producing what has been called somewhat paradoxically "converging perpendiculars." You may retire a sufficient distance from it to embrace the whole without tilting the camera. Where its position does not admit of retiring far from it, a short focussed lens including a wide angle may be used. Something may be done by raising the rising front of the camera. And lastly, if you are compelled to tilt the camera, you may use a swing-back and so keep the sensitive plate parallel to the building. You will see that in some cases you are compelled to choose amongst several evils, and it requires judgment in each particular case to choose the least. But with all lenses, if the plane of delineation be not parallel to the object delineated, there will be convergence of lines.

Homo.—Some time ago we went through a series of experiments on the effect of chlorides in collodion. In many cases there was no appreciable difference: in no case any increase in sensitiveness, but, on the whole, a little increase in clearness, and a little improvement in the colour of positives. The results were at best, however, only such as might be obtained with care without the chloride, and as, from the difficulty of getting it into solution, its use was somewhat troublesome; we came to the conclusion that the advantage was scarcely worth the trouble. If your ether had become "ozonized" or acid by keeping, the collodion would become yellow on iodizing. We have known such a thing occur even when a cadmium iodizer was used. The liberation of a little colour is by no means necessarily an evil, especially in the positive process. It is quite possible that the collodion will still work well. Pure iodide of sodium is quite soluble. We have some at present which leaves no residue even in absolute alcohol. Insolubility is a sign of the presence of some impurity. We have never met with the curdy appearance to which you refer, and cannot account for it.

L. S. B.—The pinholes appear to arise from turbidity of some of your preparations. Filter the bath and developer, and take care that your collodion is well settled. Also avoid dust, and clean your plates well. The pictures are over-developed. Tincture of iodine, is iodine dissolved in alcohol. A positive well protected from the atmosphere will be tolerably permanent, no matter what developing formula be used. You may varnish the inside of your can with shellac varnish; but if, as you state, there is only an aperture large enough for a cork, it will be somewhat difficult to get at. The only plan will be to dry it well, and then pour in some of the varnish and cause it to flow over every part, after which pour out the excess and let it dry.

A. B. C.—So far as we can judge from the prints forwarded, the negatives ought to yield better pictures. Use a highly albumenized Rive paper silver bath of a strength not less than 80 grains to the ounce; print in diffused light, not direct sunlight, and tone by that formula given in the Photographic News Almanac, in which acetate of soda is used, instead of carbonate or phosphate; or by the formula given by Mr Eliot in a recent number. Any good bromo-iodized collodion will do; but one giving a fair amount of intensity with iron development is best.

J. C. Barnard.—We will make enquiries and endeavour to ascertain how you may best gain your end. It is a case requiring some consideration.

J. R. Price.—We will write to you shortly.

F. G. L.—To make a copy the full size of the original, you must draw out the body of the camera to double the focal length of the lens. If your camera body is not made to extend so far, you can improvise an extension for the occasion by pulling the body right out and covering over the space between the front and back part with black cloth or black velvet. A copying camera is the right thing for the purpose.

J. Thorp.—The print from a dry plate by Mr. Sisson's gum process is very good indeed, and speaks satisfactorily both for your careful manipulation and the capabilities of the process. Regarding the spots and feebleness in the kept plates, we can only suggest that the washing had not been quite sufficient to get rid of all the free nitrate of silver. Regarding the formula, Mr. Sisson gave it to us exactly as he practises it himself, and we gave it just in the words we received it. The best proportions must be decided by experiment.

M. A.—We cannot speak certainly of the excellence of any negative varnish which is applied without heat. See notice of some new varnishes on another page. The fact of your collodion working well when poured from the stock-bottle, and entirely failing when used from the pouring bottle is utterly inexplicable to us. There is nothing, that we know of, in the sea air which ought to produce such results. We have only found a very great accession of sensitiveness in the vicinity of the sea. We have before us at this moment an instantaneous negative, with fine clouds, recently taken with a triple lens at the sea side.

H. Jennings, Jun., wishes to prepare some sulphate of protoxide of uranium from the peroxide. The readiest plan is to dissolve the peroxide in nitric acid, evaporate off the greater part of the excess of acid and then precipitate the uranium in the form of oxalate of the peroxide by adding oxalate of ammonia to the solution. Filter off, wash and dry this oxalate, and then ignite it in a glass tube which is closed at one end, and drawn out to a fine point at the other. When it has been kept at a red heat for five or ten minutes, and vapours have ceased to be evolved, seal up the capillary orifice and allow the tube to cool. When quite cool break it open and remove the contents (which will consist of protoxide of uranium) to a small flask. Now add pure oil of vitriol, and boil for some time, until the powder has all dissolved. Evaporate the greater part of the excess of acid off, and then add water, boil, filter, if necessary, and evaporate gently. The sulphate of the protoxide of uranium will crystallize out in the form of small green crystals. Decant the mother liquor (which will yield a further crop upon evaporation) and dry the crystals between bibulous paper. They must be kept in a well-stoppered bottle, as, like all the protosalts of uranium, they have a tendency to absorb oxygen. Our correspondent should remember, however, that the salts of the peroxide are chiefly used for photographic purposes.

F. L. P.—Glasses which have been once used and the collodion film allowed to dry on, require very careful cleaning. We do not like the common practice of soaking them in a solution of common washing soda, as it is apt to act on the surface of the glass. A little old collodion is the best thing for the purpose. Where an iron developer has been used, nitric acid should be used for the cleaning of the glasses, as without that the glass is apt to retain iron stains. For new glasses, and old ones which have had the films removed, spirits of wine and Tripoli mixed to the consistency of cream, answers the purpose of cleaning very well.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 154.—*August* 16, 1861.

"THE PHOTOGRAPHIC NUISANCE."

The phrase which heads this article is not ours; but one which we regret to say is becoming common in the public press, as designating a public annoyance which has sprung up and become rife within the last few years, to the disgust and mortification of all interested in the progress and dignity of photography.

There are few things in the world which are not the victims at times of parasitic or fungous growths, which at once mar, deform, and impoverish whatever they batten on. The weeds spring up and destroy the flowers; the tares entangle themselves with and impoverish the wheat; a rabble of plunderers hangs on the outskirts of every army; privateering is not entirely abolished among civilised nations. There are black sheep in every flock; and scoundreldom has found representatives in the church, at the bar, and amongst the medical and other learned professions. It is not surprising, then, that an art so beautiful, so popular, and so facile as photography should have been quickly inundated, and surrounded, and well nigh strangled, by a mob of "needy villains," whose only qualifications for obtaining a livelihood in any form consist in the completest incapacity, added to the most unscrupulous impudence. The fatal facility with which something may be done in the production of an image, the still more fatal "cheapness" at which a certain class of apparatus and material is vended, together with a culpable credulity and insane anxiety on the part of the public for "cheap and nasty" portraiture, has given opening and temptation to become "photographic artists" to men who would be a disgrace to the meanest mechanical calling. Some of these are detected from time to time in the production of filthy obscenities, whose hideous reality has far surpassed the most salacious limnings of the most prurient imagination, in times when the pencil only could be devoted to such polluted purposes. At other times they are found inveigling the unwary into portrait dens to be *done* in a double sense—caricature and extortion being combined in one transaction. "These cheap photographers," remarks a daily contemporary in an article we reprint in another column, "are many of them the very scum and offscourings of humanity—fellows who have not wit enough to be skittle sharpers, and not courage enough to be prize-fighters, and who find in the photographic 'studio' a convenient locality for the display of their low and clumsy arts, and the more dangerous display of their inborn knavery and philosophy."

The remarks we have just quoted are suggested by a case recently brought before the Marlborough Street Police Court, and which, we regret to add, is not a solitary one. The record of the case in the public prints stands as follows:—

"The Photographic Nuisance.—William Pimms, the keeper of a photograph portrait-place in Oxford Street, was charged with the following assault:—Mrs. Catherine Anthony, the wife of a pay sergeant of the Fusileer Guards, Wellington barracks, said she went into the defendant's shop in Oxford Street, about twelve on Saturday, to have her portrait painted for a brooch. She did not have one painted for her brooch, but had a smaller one done, and she afterwards objected to it, when she was told that it would be all right when it was dry. She afterwards returned and said she wanted her money back or a fresh portrait, and after a few words the defendant struck her on the head, rendering her insensible, and then tore up the portrait and pushed her down stairs; and the defendant's 'door man' also attacked her and damaged her clothes, and she felt certain that, if she had not been rescued, she would have lost her life. The defendant then pushed her down Oxford Street, and gave her two severe blows in the mouth.—Defendant (who insinuated that complainant was intoxicated) said she went away well satisfied with her portrait, and afterwards came back, and began 'cutting away.' He did give her a shove, and his hand might have gone in her face.—The magistrate said he had no doubt the defendant had used a great deal of unnecessary violence. It was a gross outrage on a respectable female, and defendant had not mended his case by insinuating that complainant was intoxicated. He had no doubt done that to create a prejudice. The complainant might have been a little unreasonable, but there was nothing to justify defendant's violence. He (the magistrate) was bound to protect the public. The defendant was justified in taking steps to remove a person, an objectionable person, from his premises, but not to act as he had done.—The defendant was then fined 5*l*., or imprisonment in default.—The defendant paid the fine."

Every professional portraitist is but too well aware that sitters are often unreasonable, and sometimes very provokingly so; but this can be no reason for even rudeness, still less for a disgraceful assault. Every respectable photographer is aware that trying as it may be at times to the patience, it is his interest at times to yield to, and always to treat with consideration the wishes and tastes, and even the caprices of his sitters. We may mention an illustration of the mode of dealing in such cases occuring in the practice of one of our first professional portraitists. A lady had sat for a portrait in the absence of the principal. The lady was fastidious, and the operator was patient. In turn every possible view of the face had been tried: right-side, and left-side, front, three-quarters, and profile, and almost every modification between; but the lady was dissatisfied, and resolved to try again next day when the principal would be at home. Presenting herself next morning and explaining the case, she was blandly received by Mr. M———, who had heard all particulars from his operator.

"Be so good as to take a seat here madam," placing a chair with its back to the camera.

The lady, wondering, did as she was desired; Mr. M. then proceeded gravely to place the head rest to the forehead instead of as usual to the back of the head. Having focussed, and put the plate in the camera, he said,

"Now, madam, if you will be so good as to remain quite still for a few moments—"

"Why, Mr. M., you are about to take the back of my head!" exclaimed the lady.

"Precisely so, madam. That is the only change now left for us. I have seen the pictures taken, they are all excellent Daguerreotypes, and very good likenesses. Every possible view of the face has been tried, our only chance of pleasing now, is by trying a portrait in which the face will be entirely absent."

The artist was polite and good tempered, and the lady, not entirely unreasonable, was struck with the ludicrous position: with a laugh she asked permission to see the rejected pictures of yesterday once more, and eventually selected several of them to be finished and paid for.

To return, however, to the disgraceful state of things of which the case at Marlborough Street affords an illustration. How is it to be remedied? Every respectable photographer is concerned in the removal of such a nuisance, which sullies the name of the art, and degrades the character of the pro-ession. We must confess that we are somewhat at a loss to make a suggestion on the subject. We do not imagine that we address any who are in any way associated with these Pariahs of the profession. We cannot reach them, nor do we imagine we could influence them. The whip of the law is the only means, we fear, of keeping them in check. One fruitful source of the evil is the "touting" or "doorsman" system. Without a "doorsman" to allure the victims these dens could not exist. If door touting could be abolished, this systematic photographic swindling would soon come to an end. We fear that in some cases even respectable photographers have been driven by the tide of competition to fall back upon this discreditable mode of inducing custom. We wish we could induce such, if there be any amongst our readers, to taboo such practice, and let it be abandoned to the Arabs of the profession, so that the public might be given to understand that no respectable photographer kept a touter, and if they then visit such places, they take all risks of extortion and personal injury.

Another evil contemporaneous with the nuisance of which we are speaking, and an important adjunct to it, is the Sunday trade. We have reason to believe that without their Sunday trade many of these dens must close. That is their harvest time: then victims are plentiful and are dressed for the sacrifice. Then it is that their competition tells most heavily against the respectable, middle class, fair-priced photographer, who has, in accordance with the beneficent custom of Christendom, made the seventh a day of rest. We are the sworn foes of intolerance, and utterly deny the right of the law to interfere in questions of conscience. But we must confess that we should scarcely regret to see the law relating to Sunday labour, although an enactment born of intolerance, put in force in regard to touting photographic dens, which in some parts of the metropolis are nothing short of a public nuisance in their indecent clamour. We should regard it as for once getting the use of a bad law in aid of public decency and fair play—fair play to the respectable photographer more than to the public victims, who at present we are less concerned about.

And we must add finally, that the public themselves are much concerned in the maintenance of this nuisance, against which the public press has so strongly protested, and against which we protest with as unmitigated vehemence, but more in behalf of the art and its friends than of the public. A demand creates a supply: a rage for cheap portraiture has created the supply in the form it has assumed. The public should remember that a photographic portrait does not represent simply a piece of glass, a collodion film, and an infinitessimal portion of silver; or a piece of albumenized paper, a minute trace of silver in some form, and also a little gold or sulphur. It does or should represent so many years of experience, a considerable amount of scientific knowledge, and a fair share of artistic taste and skill, together with the use of costly appliances. And to imagine these can be secured for a sum that can be counted in pence is simply a piece of the wildest folly: folly which only meets a fair reward in the fast-fading caricature which is the legitimate issue of such establishments. If photography be a mechanical art, as her Majesty's Commissioners have decided, and as some of its professors have endorsed, it at least requires skilled workmen, who are worthy of fair wages, as M. Silvy himself would admit. Let the public, then, protect themselves, if they don't honour the art; and let them pay a fair price, and avoid the den of the miscalled *cheap*, touting portrait manufacturer.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Hydriodic Acid.—This acid is very similar in character and chemical composition to the two former acids which have been treated of. There are several ways by which it can be prepared. One of the most common is to mix together in a small retort 10 parts of iodide of potassium with 5 of water. The iodide of potassium should be finely powdered, and the water added until it is of a pasty consistency; 20 parts of iodine are now to be added, and when the materials are well mixed together, 1 part of phosphorus is to be cut up, under water, into small pieces and dropped in one at a time. Hydriodic acid is evolved in abundance, in the gaseous state. It must be conducted by means of a tube connected with the neck of the retort by a cork, into a bottle of distilled water standing in a vessel of cold water. The gaseous acid will be absorbed rapidly by the water, and will form the ordinary liquid hydriodic acid. If the evolution of the gaseous acid does not proceed with sufficient rapidity, the retort must be gently warmed by plunging it into hot water for a minute or two; if, on the other hand, the gas is liberated with too great violence, the vessel must be plunged into cold water. This is a very economical way, as the whole of the iodine, both from the iodide of potassium and that in the free state, is converted into hydriodic acid, phosphate of potash being formed.

Another plan which is frequently recommended in works on photography is to suspend iodine in water, or to dissolve iodine in a dilute aqueous solution of iodide of potassium, and then to pass a current of suphuretted hydrogen gas through the solution; the iodine displaces the sulphur and unites with the hydrogen, forming a dilute aqueous solution of hydriodic acid with precipitation of the sulphur. If nothing has been added to the water but iodine, the solution need only be filtered from sulphur (provided it has no smell of hydrosulphuric acid), when it can be used; but if iodide of potassium has been employed as a solvent for the iodine, the aqueous solution will have to be distilled. If the liquid smells of sulphuretted hydrogen, this can be got rid of by shaking it up with a small quantity more of iodine. Since hydriodic acid dissolves iodine easily, a very strong solution of the acid can be prepared by alternately dissolving iodine in the solution and then passing sulphuretted hydrogen through until the deep brown colour is removed. This, however, is not a good plan to prepare the acid for delicate photographic work, although it is very easy and convenient. It is always liable to contain some sulphur compounds from which it is difficult to purify it. We think the best plan is to adopt a suggestion recently made by M. Personne, and prepare it by the action of phosphorus and iodine on water in the manner recommended in the first process above given, using, however, amorphous instead of normal phosphorus. It is enough to place a sufficiently large quantity of amorphous phosphorus in a tubulated retort with a glass stopper, to cover it with a layer of water, and to add the proper amount of iodine, when, by the aid of a slight degree of heat, a regular current of gas is obtained perfectly free from iodine vapour, which may be conducted through water and absorbed in the usual manner. Another very convenient plan, which may be useful to some photographers, in the absence of distillatory apparatus, is to dissolve a known weight of iodide of barium in water and then to decompose this by adding an exactly equivalent quantity of sulphuric acid. By filtration from the sulphate of baryta an aqueous solution of pure hydriodic acid will be obtained.

As prepared by either of these methods, hydriodic acid is a strongly acid, colourless liquid, fuming in the air when strong, and having a sharp, suffocating odour. The concentrated acid is very heavy, having a specific gravity of 1·7; when of this strength it boils at 126° C, and distils over unchanged. By boiling, a weaker acid becomes stronger, and a strong acid weaker, the ultimate strength being an acid of the above specific gravity. Hydriodic acid when exposed to the air gives off hydrogen to the oxygen of the atmosphere and become deeply coloured by the liberated iodine. As the decomposition proceeds the iodine is gradually precipitated in the form of beautiful large crystals, the supernatent solution being scarcely anything but pure water. Hydriodic is decomposed by many other agents besides the atmosphere. Oil of vitriol added to it separates iodine with formation of sulphurous acid. Iodic acid, or an iodate, likewise instantly decompose each other with liberation of iodine; nitric acid, as well as other oxygen compounds of nitrogen, also liberate iodine.

The liberation of iodine from old collodion is a subject closely connected with that of the decomposition of hydriodic acid. There are several ways in which this colouration of the collodion by iodine can take place; if the cotton or paper contains the slightest trace of free nitric or sulphuric acid, owing to its not being thoroughly washed (and this is not so easy to accomplish as is generally supposed), the liberation of iodine in the collodion is almost certain to take place a short time after its being made. It is also possible that there may be a gradual decomposition of the zyloidin itself, and consequent liberation of the iodine by this means, with formation of nitrates or nitrites; but the most likely cause is the following:—The ether gradually absorbs oxygen from the atmosphere, and is converted into acetic acid; this, by its superior affinities, reacts on the iodide present, converting it into acetate, with liberation of hydriodic acid, whilst this latter, under the influence of the atmospheric oxygen, is gradually converted into water and iodine. The reason which has induced us to adopt this explanation of the colouration of old collodion, is that bromised collodion does not undergo any change of colour however long it is kept. Now if the former agencies were at work there is no reason why bromine should not be liberated from a bromide, as well as iodine from an iodide; but on the latter supposition no change can take place, the affinities of acetic acid being insufficient to displace hydrobromic acid.

Similar impurities are likely to be present in commercial hydriodic acid as in hydrobromic acid. It may thus contain *phosphorus* from the mode of its preparation. The method of detecting this is the same as in the case of hydrobromic acid, viz., oxidation with nitric acid. *Sulphuric* and *organic compounds* may likewise be present, and may be detected as detailed in our last chapter. Free *iodine*, which is a very frequent impurity, is at once seen by its colour; it is best removed by agitation with a little zinc or cadmium, and then distilling, the iodine uniting with the metal will remain behind. Another plan is to add a drop or two of sulphuretted hydrogen water to the coloured acid, shaking after each addition until the colour just disappears. Too much must be avoided or the liquid will smell of it. If this is the case the excess of sulphuretted hydrogen must be removed by heating the acid to the boiling point. Another impurity which may be present in commercial hydriodic acid is hydrocyanic acid or cyanogen compounds. Some samples of iodine have been found to contain iodide of cyanogen, and this compound would in the process of preparing the hydriodic acid as decomposed into that and hydrocyanic acid. This is not a very likely impurity; but as it would be productive of great injury if it were present, it will be advisable to test for it. This may readily be done; add a little sulphide of ammonium to the suspected acid and boil, this will convert the cyanogen compound into sulphocyanide of ammonium, which has the property of communicating a most intense blood-red colour to persalts of iron. If therefore the solution, after the excess of sulphide of ammonium is boiled off, gives a red colour, or even a pink tinge, upon addition of a drop of solution of perchloride of iron, it may be considered as a proof that a cyanogen compound has been present.

A NEW PHOTOGRAPHIC PROCESS.

By James Eugene Balsamo, Professor of Natural Philosophy, Lecca, Italy.

Extrusted, during the year 1859, with the direction of laying the submarine cable between Italy and Turkey, in the Ionian Sea, I experienced the want of being able to reduce the generators of electricity to the simplest possible expression. I have already published some of the results obtained, but I now propose to describe a new photographic process, which is the fruit of my electrical experiments. During the working of the various piles I had contrived, I discovered that hydrochloric acid enjoyed the property of dissolving phosphorus, which it afterwards abandoned, in a flocculent state, under the influence of the action of light. Thereupon I conceived the idea, that here was one of those substances which, although naturally inert to light, nevertheless undergo a sort of molecular orientation on the part of the phosphorus precipitated in the hydrochloric acid; and experiments rigorously pursued, together with long observations, have demonstrated that there is not any soluble salt which can resist the modifying action of light, in this phosphor-hydrochloric solution. But the salt to which I give the preference, both on account of the facility with which it may be everywhere obtained, and on account of its low commercial value, as well as for its sensitiveness—is acetate of copper. I proceed in the following manner:—I prepare my hydrochloric solution by digesting phosphorus for a long time in hydrochloric acid, at the ordinary temperature, or if required in haste, at a temperature of 180° to 200° F. The older this solution becomes, the greater its photogenic properties. After thus saturating the hydrochloric acid with phosphorus, I dilute it with acetate of copper until the colour of the liquor becomes of a deep olive-green. This cupro-phosphor-hydrochloric solution is poured into a glass or porcelain dish, and a sheet of paper is immersed in it during three or four minutes; then another sheet is added, and so on, until a sufficient number of sheets is immersed, which must be separated and turned from time to time, so that the solution may fully penetrate the pores of the paper.

After five or six hours the paper will have thoroughly imbibed the solution, and the sheets are carefully separated, avoiding rents and creases, and then hung up to dry sheltered from dust and access of light. It is an essential condition to the sensibility of the paper that it be quite dry; for it becomes very hygroscopic after being submitted to the sensitizing bath, and the least presence of moisture diminishes its sensibility.

When it is desired to take pictures on this paper, a sheet of bibulous paper must be placed at the back, to absorb the moisture disengaged under the influence of the calorific rays. The paper remains under the negative until it acquires a grey tint. It is then withdrawn from the printing frame, and submitted during the space of five minutes to the vapours of sulphuretted hydrogen, which possesses the property of attacking those parts of the proof which have been acted upon by light. The image being thus fixed is washed in plenty of water, which removes all the salt of copper from the paper, and the picture appears with the greatest clearness of contour and detail. To render it permanent, and to tone it of an agreeable colour, the proof is soaked in a solution of nitrate of bismuth. But as an insoluble subsalt is formed in the water, a little nitric acid must be added. The more the solution is diluted, the longer the proof must remain in it, and the greater amount of detail will be eliminated.

In the bismuth bath, a real molecular substitution of bismuth for copper takes place; and at the expiration of a certain time, the liquid becomes of a green colour, due to the nitrate of copper which is formed, and bin-oxide is also found deposited.

The pictures obtained by this process are indestructible, for an external coating of oxide of bismuth is formed, and neither chlorine nor any other transforming substance remains. Chlorine, which is one of the most active photogenic elements, is also a de-hydrogenizing agent *par excellence*, and its oxydizing effects are an indirect consequence. From this arises the transformation of the metallic sulphides of the proofs into colourless sulphates. If we substract (as can be done) the chlorine from the pure photographic proofs in a salt of silver, we shall have pictures more permanent and less sensible to the causes that can efface them, as I have proved by experiment.

The photo-chemical phenomena manifested in my process are the following:—Light acts directly upon the phosphorus, which, in the molecular disturbance, reduces the salt of copper and brings it to the state of bin-oxide. For, if instead of fixing the picture by sulphuretted hydrogen, we soak the proof in water, on removing it from the printing-frame, we shall see the image appear by transparency, and formed entirely by phosphorus. As I have before said, copper in the state of bin-oxide is very easily reduced by hydrogenized matters, from whence it results that a very short exposure to the vapours of sulphuretted hydrogen suffices to fix the image in a state of sulphide. But as the bi-sulphide of copper, which is very unstable, passes to the state of sulphate, and finally is effaced. I replaced it by bismuth. Thus the bismuth, in being substituted for the copper, re-composes the image, fixes and tones it; and the colour will be more or less deep, according as the sensitized paper is rich in cupreous salt, the duration of the exposure in the printing-frame, the intensity of the light, and the strength of the bismuth bath. If we wish the toning to be deeper, the picture may be afterwards immersed in a weak solution of nitrate of silver, which is not altered, but plays the part of a negative metal to the bismuth. The curious phenomena I have observed in many metallic salts during my photogenic experiments will form the subject of a future communication.

THE COLLODIO-ALBUMEN PROCESS.

BY JAMES MUDD.

I will not argue the question of the comparative merits of the various dry processes, or assume for the collodio-albumen a place higher than some others. I believe that there are half-a-dozen of tolerably equal merit, and that any one of them may be made to yield results equal to the others if carefully worked out. The process under our notice has many admirers, and is successfully managed by many photographers. In some hands, however, it does not answer. To those who have failed, perhaps the following description of the process may be of some use, although I fear I am only repeating much that has been said before.

It is important that the plate should be well cleaned. There are various methods of doing this; but as this is necessary in all processes, photographers will know how to perform this simple operation. Coat the cleaned plate with collodion in the usual way. After allowing the film to "set" well, sensitize in the ordinary nitrate of silver bath. If the collodion should give a very thick and creamy film, it must be reduced by adding ether. After sensitizing, the plate must be well washed. This is done best by having two large water dishes with a tap running into each; into the first of which the plate should be immersed, moved about, and then removed into the second. A third dish is required containing a weak solution of iodide of potassium and water, about one grain to the ounce of water. Place the plate in this solution two or three minutes, gently moving the dish the while. Rinse with tap water, and drain a minute.

The next operation is pouring on the iodized albumen. It is made as follows:—

To the whites of 10 eggs add—
50 grains iodide potassium
10 ,, bromide ,,
100 minims liquid ammonia
$2\frac{1}{2}$ ounces water.

Dissolve the iodide and bromide in the water, then add the ammonia. Mix all together with the albumen, and beat the whole into a froth. Let it settle. It is then fit for use.

While the plate is still wet from the washing, and after it has drained a moment or two, pour over its surface the albumen. Pour off again. Repeat this twice. The same albumen may be used for two or three plates, but becomes too limpid, by mixing with the water from the plates, to use for more. It should be thrown away, and a fresh quantity obtained. Now allow the plate to drain five or ten minutes; then dry it rapidly before a clear bright fire, and make it quite hot.

The plate in its present state is not sensitive to light and will "keep" for an indefinite period. I have never known them to deteriorate in the slightest degree, and have frequently used them twelve months old. This keeping-quality is convenient, as it enables the photographer to prepare, during the winter months, a stock of plates for the summer season. To make the plate sensitive, it is only necessary to dip it for one minute into the aceto-nitrate bath:—

40 grains nitrate of silver
$\frac{1}{2}$ drachm glacial acetic acid
1 oz. water.

Before immersing, however, warm the plate slightly at the fire, or in any convenient way. After taking it out of the bath, drain a moment, and then wash as before in the dishes and finally under the tap. Common spring water will do. It is not necessary to use distilled water either in the preparation, or in the development of the plates. After washing, drain and place on blotting-paper to dry. They may be dried artificially, but will dry without heat in about ten minutes.

Plates so prepared will keep good in cool weather six or eight weeks, but in July or August it is better not to trust them longer than a fortnight. In hot weather there is a tendency to turn red under development if kept sensitized longer.

And now as regards sensitiveness and exposure. Compared with wet collodion these plates are five or six times less sensitive.

It is difficult, in figures, to give a correct idea of the time, so much depending upon lens, subject, aperture, &c. One or two trials will decide this better than anything I can say. It may be some guide, however, to compare it with other dry processes, the Fothergill, honey, gelatine, and others. It is quicker than any of those I have named, and certainly stands next to wet collodion in sensitiveness.

The development of the latent image is the most important operation in this process. It is slow, but on that account very manageable and entirely under control. My method of developing at present is with pyrogallic acid. I have seen, however, good results by gallic acid development. To develop with pyro, take the exposed plate, and after placing it upon the stand, pass over the surface a little common clean water; then take a plain pyro solution without acid, say two or three grains to the ounce of water, and pour it on the plate. This mixture must be made just before use, as it does not keep without acid. The sky and high lights will appear almost immediately, and ultimately, without either silver or acid, the whole picture comes out. It now requires intensity. Now take—

Pyro ... ... 2 grains
Citric acid ... ... 1 grain
Silver, two or three drops of 20-grain solution,

and pour on the plate. If necessary, add more silver until sufficient intensity is gained.

During the development it is more than probable that the surface may be marked by streaks or stains; or a deposit may cover the whole plate. If this should occur, stop the development, wash with water, and with a piece of fine cotton-wool rub away these defects, and go on again with the development. The horny surface of the albumen covering enables you to do this without fear of damaging the negative. This is the great advantage the process has over every other. The Fothergill, gelatine, and other processes will not bear long development. If it is prolonged, a deposit falls, and the softness of the film does not allow it to be removed. The collodio-albumen plate can be developed for hours or days, because, though the deposit falls, it can be wiped off again and again. This is an immense advantage when the picture is under-exposed, as it can be frequently brought out by long development.

To know when a negative is sufficiently developed is a nice point; and it is very easy to be deceived in the comparative darkness of the operating room. A negative always looks a great deal more intense in the room than it does when brought to the light. This must be allowed for. It is an excellent plan to have a good negative in the room with you, in order to compare with the one you are producing. Do not judge of the merits of your picture by the blackness of the sky, but by the details of the picture itself. A really good negative will rarely have a dense sky.

Warm solution has been mentioned lately as useful in pushing the development. It ought only to be used, however, when the picture is under-exposed. I have always used it in the winter months, when the temperature of the water was low, and in pictures which would not appear with cold water.

To develop with gallic acid:—Take the exposed plate and put it, face upwards, into a glass or dish, with a sufficient quantity of a saturated solution of gallic acid to cover it. When it has remained five or ten minutes, add a few drops of 10-grain silver solution, and mix well in the dish; the picture will gradually appear. When all the details are out, add more silver till the development is complete. This is a slower method than the other; but several dishes, each containing a plate, may be attended to at the same time.

Fix in hyposulphite of soda, about six ounces to the pint of water. Cyanide of potassium must not be used for this purpose.

Such, then, is the process as at present used by myself in the production of my landscapes.

In connection with this subject I cannot forbear mentioning the name of a very successful operator here in Manchester, Mr. Wardley, who has worked the process with me for several years, and to whom I owe many valuable suggestions, not the least of which is the plan of first using the developing solution without acid.

NEGATIVES BY POSITIVE PROCESS.

[The following communication does not profess to detail any new process; but is merely a statement of what has, in principle at least, before been published. It has, however, this advantage, that it has the exact formula and mode of manipulating by which the writer produces successful results; and this is, after all, the best recommendation which any process can possess. The precise collodion which was named by the writer is not to be obtained now, but any *good* bromo-iodized collodion wlll answer the purpose. It is desirable, however, that it should give a moderately intense image to commence with, that is, by the action of the iron developer only.]

Dear Sir,—Acting according to the promise I gave you last week, I now send you the details of the process by which the negative, a proof of which I sent you, was taken, and which is the one I always use with success.

As to collodion, I always use a positive one, which gives, when taken from the bath, a good, even, and creamy film, and is free from waves or other irregularities, and one which will bear washing. * * * *

The bath should be composed of the *pure* recrystallized nitrate of silver, and not the commercial crystallized sold for printing, which if used would be a never-failing source of fog and stains. Recrystallized nitrate of silver 40 grains to one ounce of distilled water. In making an entirely new bath, I generally dissolve 3 ounces of silver in 33 ounces of distilled water; then coat a large plate with collodion on both sides and let it remain in the bath a few hours to saturate the solutions with iodide of silver. After each day's work is completed, I return the solution to the bottle, and wash out the bath. This prevents the necessity for repeated filtering and consequent loss of solution. After the bath has been saturated with iodide of silver, as before described, it is possible that on taking a picture the bath may now and then fog. To remove this tendency, I keep in a separate bottle a diluted solution of pure nitric acid, in the proportion of nitric acid one drop, distilled water one ounce. One drop of this diluted solution of nitric acid added to a bath of about 33 ounces will generally, if the silver be quite pure, make it yield good results. In no case do I add even this small proportion of acid to the bath when good results can be got without its use.

A bath thus prepared will work equally well for positives or negatives with the same collodion.

Expose just half as long again for a negative as for a positive. Then develope with a solution of proto-sulphate of iron prepared as follows: iron, 2 drachms and I scruple; water, 15 ounces, adding I drachm of glacial acetic acid to an ounce of the above iron solution immediately before using. I get all the details well out, and as much intensity as you can get at this first stage, by throwing the solution on and off the plate, as in developing a negative with pyrogallic acid.

I now wash well and fix with cyanide not too strong. Intensify while the plate is wet as follows: water, 15 ounces; pyrogallic acid, half a drachm; citric acid, half a scruple. Pour a little of this solution of pyro over the plate so as to get it to flow evenly first; then add two or three drops of a 30 grain nitrate of silver solution to an ounce of the above solution, when any amount of intensity can be gained. Pictures so developed are not so hard, having such violent contrasts of light and shade as those taken with an intense negative collodion, and developed with pyro and silver.

It may sometimes happen, under certain conditions of light and temperature, that some little difficulty is experienced in getting sufficient density with the above; when such is the case, after well washing to free from pyro, pour over the plate a saturated solution of bichloride of mercury; wash again, then pour over the plate a solution of iodide of ammonium, two or three grains to the ounce, exact strength not important. If iodide of ammonium is not at hand, iodide of potassium will do, but I prefer the former when I resort to this, which is not very often. I would not counsel the use of the bichloride of mercury and iodide in any case where it can possibly be dispensed with. It is very well as an occasional makeshift, but not for constant and continual use.

After the plate is dry, varnish with the Soehnee varnish. If it would be acceptable I will another time give you my experience with hot developers for winter work, as well as a few words about glass positives, with developers of various strengths.—I remain, dear sir, yours very truly,

T. S. Swatridge.

Yeovil.

SOLAR CHEMISTRY.

Light and heat are so closely allied to each other and to all natural objects, and both are so intimately connected with man's existence and happiness, that every discovery regarding either is of the highest value, not merely to science, but also to manufactures and the arts. By those who devote their lives to the study of science, every new fact is regarded as, in itself, another treasure gained. Those, however, who are engaged in commerce or in any industrial pursuit, are apt to measure each acquisition by its practical value, and the immediate addition it makes to human wealth. To the attention of both these classes, the late discoveries regarding light recommend themselves. By glancing at their connection with previous discoveries we shall best be enabled to appreciate their importance and practical value.

About 1666, Newton resolved white sunlight, by means of a prism, into seven primitive colours, and in 1704 he gave his discoveries to the world in his splendid work on Optics. In 1808 Wollaston first noticed in the prismatic spectra, dark lines, the positions of which were so accurately determined twelve years afterwards (in 1820) by

Frawnhofer, the optician, that they are sometimes called Frawnhofer's lines. The latter observer counted 600 of these dark lines or breaks in the coloured spectrum, and Sir David Brewster, in 1833, by his experiments with nitric oxide, succeeded in counting more than 2,000 lines. At certain seasons of the year, some of these lines are not discoverable in the spectrum, a phenomena attributed by Sir David Brewster to different altitudes of the sun, and to the different absorption of the rays in their passage through our atmosphere. In the reflected light of the planets and their satellites, we discover, as might be expected, all the peculiarities of the solar spectrum. But when we apply the same method of analysis to the light of the fixed stars we find strange, and hitherto unexplained, differences. Frawnhofer called attention to the fact that even in those fixed stars which have an equal and perfectly white light the dark lines are not the same; probably showing that different metals predominate in the gaseous envelopes of different stars. "The dark lines," says Humboldt, "in the spectrum of Sirius differ from those of Castor and the other fixed stars. Castor likewise exhibits different lines from Pollux and Procyon. The light of incandescent solid bodies and the light of the electric spark also exhibit great diversity in the number and position of Wollaston's dark lines."

The mystery of these dark lines in the spectrum remained unsolved long after it was known that every simple substance could be distinguished by the colour of its flame when subjected to prismatic analysis. Brewster discovered that the flame of alcohol diluted with water, consists chiefly of homogenous yellow rays. Herschel discovered that sulphur, when burning intensely, gives a light of similar colour. In 1826, 1833, 1834, 1836, Mr. H. F. Talbot directed public attention to the same subject, and distinctly announced, in 1834, the truth that "optical analysis can distinguish the minutest portions of two substances, as lithia and strontia, from each other with as much certainty, if not more, than any other known method." Professor Wheatstone, in 1835, read a paper "On the Prismatic Decomposition of the Electric Voltaic, and Electro-Magnetic Sparks," at the meeting of the British Association in Dublin, directing his attention, however, to the bright lines, and concluding with the significant remark, that "the peculiar luminous effects produced by electrical action on different metals depend on their molecular structure." He also added, "We have hence a new optical means of examining the internal mechanism of matter, in addition to those which Sir D. Brewster and other philosophers have already placed at our disposal." In 1845, Professor Miller read at Cambridge, before the British Association, an account of his experiments and observations on dark lines in the prismatic spectrum produced by the passage of light through coloured vapours and gases, and from certain coloured flames. In this valuable paper he gave a large number of most interesting facts, and almost anticipated, by nearly sixteen years, the discovery for which we are indebted to Kirchhoff. He then stated, in regard to the absorptive action of the sun's atmosphere, "that if solar light be transmitted through a flame exhibiting well-marked black lines, these lines re-appear in the compound spectrum, provided the light of day be not too intense compared with that of the coloured flame. It would, therefore, appear that luminous atmospheres exist, in which not only certain rays are wanting, but which exercise a positive absorptive influence upon other lights." The full meaning of this statement was, however, not perceived at that time. Even with such a plain statement of the truth that certain luminous atmospheres absorbed certain lights, the dark lines of the solar spectrum remained a standing puzzle. And it was only last year that Kirchhoff proved clearly that these dark lines are caused by the absorbing influence of certain constituents of the solar atmosphere, and that these constituents are the metals—iron, magnesium, nickel, chromium, potassium, and sodium.

But in addition to these discoveries of metals in distant worlds, this method of spectrum analysis has been applied to the discovery of new metals on our earth. In examining the spectra of the alkalies obtained from certain mineral waters, Bunsen observed two bright blue lines, which gave evidence of the presence of a new metal. This new metal—cæsium—has been obtained separate; also others, such as rubidium and thallium; and as this path has only now been opened, we may anticipate, as the result of further researches, many valuable discoveries. At present we are justified in stating, as a general law, that every simple substance in nature—either upon the earth, or in the sun, or in the remotest regions of space—has its peculiar bands of light. its own colour and shade, which distinguishes it from every other; and that it emits, radiates and absorbs its own colours exclusively. There is a mysterious but most intimate connection between the atoms of the etherial medium, whose vibrations give us sensations of light and colour, and the atoms of those elementary substances which we can handle and weigh. Though the nature of this connection may long remain unknown, new proofs of its reality may be expected to accumulate daily.

To assist in exploring these new fields, science calls art and industry to its aid, and new instruments are invented, and new manufactures originate. Already five or six spectroscopes, or spectrum analysers, are in the market. Whether this new invention will prove as valuable an aid to science as the telescope, polariscope, and microscope, we know not; but who can limit the powers of an instrument which is equally applicable in detecting the presence of the one hundred and eighty millionth part of a grain of matter in the dust beneath our feet, or the metals floating around the sun, or around distant stars, whose light travels for thousands of ages before reaching our planet? Reasoning from known facts regarding the polarization of light, and by the use of Arago's polariscope, we can ascertain whether the source of any light is solid, liquid, or gaseous. Applying this method to the sun, we obtain clear evidences of its being a solid nucleus, surrounded by a glowing, gaseous atmosphere.

Reasoning from equally well-known facts regarding the refraction, radiation, and absorption of different colours, and using the simple prism which proved so valuable in the hands of Newton, we have analysed this gaseous atmosphere as the metallurgist separates ores, or the chemist resolves into its simple elements any of the compound substances common in the laboratory. At present, however, this science of solar chemistry is only in its infancy. We know not yet why the light of the sun is white; why the fields and forests in summer time are green; why the sky is blue; why the planets and stars vary in colour—some white others yellow, or red, or green, or blue. Even the simplest facts regarding light, heat, and the substances generally called imponderable, are yet unsolved mysteries. We have only commenced to cultivate the new field, and know as little regarding the number or variety of the instruments that may be required in prosecuting our researches as of the rich fruits it may yield.

The lectures of Professor Roscoe and Professor Tyndall, recently delivered at the Royal Institution, give so clear an outline of the discoveries of Bunsen and Kirchhoff, and their connection with the previously-ascertained truths of optical science, that we confine our remarks to the history of the discovery, and its importance. They have questioned light, and compelled it to tell the story of its birth. They have given us visible, if not tangible proof of the unity of the solar system. Not merely as proved by Newton are all planetary bodies bound to the sun by the law of gravitation—they are all composed of the same elements. Probably all the simple bodies which chemists have discovered upon the earth exist also in the sun, and in all the planets of the solar system, though, as Newton suggested, "variously concocted." The conjectures of the ancient philosophers of India and Greece are thus returning to life. We have revived and established the doctrine of Aristarchus of Samos, that the fixed stars and the whole planetary system are of one and the same nature.—*Mechanics' Magazine.*

PHOTOGRAPHIC DENS AND "DOORSMEN."

(From the *Daily Telegraph.*)

There are functionaries called inspectors of nuisances, whose duty it is to rout out and report the execrably filthy hovels which sin against the provisions of the Common Lodging House Act; to take care that laystalls and shambles, cesspools and sewers, gasworks and bone-boiling houses, tallow manufactories and glueworks, are not unnecessarily offensive to the public nose and the public lungs; who seize upon diseased meat, and in a measure perform the functions of the old "aleconners" and ward-jurymen. It is true that they no longer chop up fraudulent weights and measures before the door of the offending tradesman, pour sophisticated beer and adulterated milk into the kennel, administer a round dozen to chapmen or costermongers whose fruit is bruised or whose fish is stale, and nail the ears of dishonest bakers to their own doorposts. Would they did! to say nothing of the benefit that might accrue to the community at large if the inspectors of nuisances were permitted to maintain a pillory, stocks, and whipping-post of their own at some convenient spot—say in the vacant enclosure round St. Paul's Cathedral—and there administer summary punishment, or expose to public view the swindling shopkeepers who sell worthless or damaged goods—the insolent omibus-conductors and extortionate cab-drivers, who fleece and insult ladies—and the abominable little half-naked ruffians who turn "cart-wheels" in the mud, to the terror of horses and of nervous passengers. Such a rough and ready justice would be contrary to our notions of civilization, but the substantial benefit derived would be large. What a comfort would this summary castigation be to the defrauded customer who has bought a sleezy half-cotton for a glacé silk, or a catskin muff for a chinchilla! How good men would rejoice to see the grocer who sands his sugar and birch-brooms his tea squatting in the stocks, or the insolent "cabby" who has demanded half a crown for a shilling fare wriggling his head in the penal collar of the pillory. Inspectors of nuisances have no power to impose inflictions such as these. They do their duty, as an occasional police-court case shows; but their operations are, after all, of a very lame and limited nature, and the public have got into the habit of mixing them up with the district surveyor and the gentleman who comes to look after the gas-meter or the cistern, and their jurisdiction is questioned and their functions cavilled at, till a general impression arises that they are but a little better than excisemen, and decidedly inferior to the collectors of water-rates.

In the streets of London there are at present some patent and visible nuisances which call loudly for abatement, but which, unhappily—owing, we presume, to a distortion of the principle that every Englishman's house is his castle—not only inspectors of nuisances dare not meddle with, but parochial authorities seem powerless to touch. Foremost among these stands the photographic nuisance. We are, it is needless to say, sincere admirers of this delightful, useful, and humanising art; and, in its proper place, photography is capable of doing, and has done, immense service to the cause of education and civilization. In its humbler aspect, too—in its mere shape of a substitute for the craft of the cheap miniature painter and the profile cutter—we see nothing to object to in photography; and there is certainly no reason why the cook or the housemaid out for a holiday, or the policeman off duty, the lacquey anxious to see his plush and powder transferred to glass or paper, should not "have their pictures done" as well as the dashing officers and brilliant ladies who crowd the studio of a Mayall, a Watkins, a Claudet, or a Lock. But *est modus in rebus.* There is a reason in roasting eggs. There is a golden mean to be observed in the art sacred to Phœbus. When we find photography associated with the lowest ruffianism and blackguardism, and made the medium of imposture and extortion, we are apt to grow somewhat out of patience with the proprietors of popular cameras and the manipulators of "portraits for the million." We are not alluding just now to the human skunks who have turned photography into a means for the production of infamous pictures, and some of whom are even now, thanks to the late Lord Campbell's Act, expiating in the House of Correction their offences against good morals. Our censure is directed against the low dens of cheap photography, with which even the most respectable of our thoroughfares are becoming more and more rapidly infested. There is a duplicate system of ruffianism in these disgraceful places. There is the "professor," or "manipulator," or "focusser," or whatever he may call himself, who keeps in the dog-hole he terms a "studio;" who executes vile libels on humanity which he misnames portraits; who enhances the original price; who bullies women and terrifies boys and girls into buying expensive frames, or having the blear-eyed patches he has drawn from the camera coloured; and who, in default of finding dupes, or on being remonstrated with, resorts to such "manipulatory" processes as striking, kicking, and half throttling his sitters. These cheap photographers are many of them the very scum and offscourings of humanity—fellows who have not wit enough to be skittle-sharpers, and not courage enough to be prize-fighters, and who find in the photographic "studio" a convenient locality for the display of their low and clumsy arts and the more dangerous display of their inborn knavery and philosophy.

Low and degraded as these fellows are, they have associated with them even lower varieties of the "cad" species. To every one of these cheap photographic studios there is attached one or more hired bullies called "door men," whose vocation it is to prowl up and down before the portal of the unwholesome temple of black art, to thrust villanous portraits into the faces of the passers by; to make use of filthy and ribald talk to the giddy girls who stop to stare at the framed display of portraits; to exchange blackguard repartee with "the door men" of some neighbouring and rival studio; and, if need be, to assist their employers in ejecting, pummelling, and otherwise maltreating troublesome customers. In the New-cut, and before the discovery of photography, these gentlemen found exercise for their lungs, and a vent for their filth, in descanting on Saturday nights on the merits of flyblown butchers' meat and decayed vegetables, and were known as "Barkers." Two recent police cases, in one of which the complainant was the wife of a sergeant in the Guards who had been most shamefully abused and beaten by a fellow called Pimms, keeping a cheap portrait place in Oxford-street, and his "door man," show to what a height this photographic nuisance has grown, and the imperative manner in which its suppression is called for. Is there no means of proceeding against these "door men" by indictment? Can they not be punished for obstructing the thoroughfare? In common law it might be decidedly argued that every invitation to have your portrait taken, proceeding from one of these disgusting fellows, is a provocation to commit a breach of the peace. It took an Act of Parliament to put down the betting-shop nuisance. Let us trust that some mode less elaborate and less expensive may speedily be found for mitigating this atrocious nuisance of cheap and nasty photographers and their ruffiianly "door men."

Dictionary of Photography.*

Qualitative Analysis, in chemistry, designates the process whereby the constituents of a compound are determined by observing the reactions which determine their qualities. Thus, a solution is to be examined for the presence of silver. If sulphuretted hydrogen be added, and a black precipitate, sulphuret of silver, falls, that is one indication of the presence of silver. To another portion of the same solution hydrochloric acid is added, and a white curdy precipitate is formed. To half of this nitric acid is added, which produces no effect upon the chloride of silver. To the other half ammonia is added, which at once dissolves the chloride of silver. These tests would be sufficient to determine the presence of silver in the solution. This is one of the simple acts of qualitative analysis which the photographer often may be called upon to perform.

Quantitative Analysis designates the process by which, the nature of the contents of a compound being known, the

* Continued from p 380

proportions in which they are present are determined. Thus a solution having been ascertained to contain silver, the amount of silver present may be ascertained by precipitating the whole in the shape of a chloride by means of hydrochloric acid, and then carefully weighing the precipitate. Or it may be ascertained by observing exactly the amount of a solution of chloride of sodium of known strength required to precipitate the amount of silver present, and a calculation based on the known relations, will determine the amount of silver present. This is one of the most important quantitative analysis which the photographer is called upon to perform. The exact proportions and modes of proceeding have already been detailed in the early part of the present volume.

Quarter-plate.—A term used to designate a certain size of plate used in photography. In the early days of photography the largest size used for a daguerreotype plate was $8\frac{1}{2}$ inches by $6\frac{1}{2}$ inches, and this was called a whole plate. A quarter-plate is one-fourth of that size, and is in the proportion of $4\frac{1}{4}$ inches by $3\frac{1}{4}$ inches. A quarter-plate lens is a lens intended to cover satisfactorily a plate of the dimensions just stated.

Quick Action in Lenses.—The term quickness of action in lenses is used to designate the rapidity with which a photographic image is formed by them on a sensitive surface. This quickness depends upon a judicious combination of many circumstances, such as the form, colour, and quality of the glass, the number of reflecting surfaces, the focal length, and the relation of the aperture thereto. The purer the glass in colour, and the fewer the reflecting surfaces, other things being equal, the more rapid will be its action. The chief circumstance affecting rapidity is the length of focus and the amount of light admitted. The shorter the focus and the larger the aperture, the greater the quickness of action. The most rapid lens perhaps in existence is that used by Mr. Skaife in his pistol camera, in which the width of the aperture is as great as the focus of the lens. The length of focus is one inch, and the aperture is one inch. Speaking roughly, in round numbers, we may state that in portrait lenses generally the amount of full aperture is generally about one-fourth of the focal length of the lens. As a rule, and other things being equal, the length of exposure increases as the square of the focus of the lens; thus double the focus will require four times the exposure, if all other conditions remain the same. So also the exposure is increased in the square of the ratio with which the aperture is decreased, so that an aperture of half the diameter will require four times the exposure, as it only admits one-fourth as much light. These are general rules, but they are found to be materially modified in practice by a variety of circumstances.

Quick Lime, protoxide of calcium, Ca. O. Its chief use in photography is as a dessicating agent. Alcohol is sometimes distilled over it to deprive it of water. Quick lime is also used in drying boxes for sensitive paper instead of chloride of calcium, over which it has some advantages.

Quicksilver, or Mercury, Hg.—A peculiar metal which at one time was of much importance in photography, and some of the salts of which are still largely used for different purposes by photographers. The bi-chloride of mercury is the most useful, and is used for whitening positives and intensifying negatives. It is soluble in 3 parts of boiling water and in 16 parts of cold water. To effect this solution it should, however, be very carefully powdered and well agitated. It is sometimes recommended to dissolve it in hydrochloric acid, and then dilute with water. This practice is not desirable, as the acid injures the film. Chloride of ammonium added, rapidly increases its solubility and does not injure its action. In the negative it is generally converted into iodide of mercury by means of iodide of potassium, or into a sulphide of mercury by hyposulphite of soda.

Ramsden's Eye-piece, or Positive Eye-piece, is a combination of two plano-convex lenses placed in a tube with their convex sides opposite each other at a distance suited to their foci. It is intended for astronomical purposes, but is sometimes used for magnifying the image on the focussing glass of the camera. Magnifying glasses of a somewhat similar construction, but lower power are, however, generally made and used for the purpose.

Radiant, in optics, the luminous point or object from which light emanates. The *radiant point* is the point from which a pencil of light diverges, as the *focus* is the point to which it converges.

Raisin Extract.—This is a solution of grape sugar, gum, and diastase, proposed by Mr. Sebastian Davis as a preservative for dry plates. It is found in natural combination in the common raisin or dried grape. The solution is made by putting four ounces of stoned raisins into an imperial pint of boiling water, and subsequently filtering, the extract is used alone or in conjunction with albumen, in the Fothergill process, and gives fine-toned negatives.

Raspberry Syrup Process.—One of the numerous family of preservative processes, the invention of the Rev. J. Lawson Sisson. The plate being excited in the usual way, is well washed in several waters, is finally placed for a short time in a bath made of one part of the raspberry syrup sold by confectioners, to three of distilled water. It is then drained and dried. The exposure is about the same as in the Fothergill process, and the negatives very fine.

Reaction.—A term used in chemistry to describe the mutual action of chemical agents upon each other.

Recovery of Silver from Waste Solutions.—A very small portion of the silver used by photographers goes to form the picture, either on glass or paper. Not less than 90 per cent., it has been calculated, of the silver made into solutions finding its way into the sewer in various forms of waste. The simplest method of recovering the silver from the washings of prints, developing solutions, exhausted fixing solutions, and general washing waters, is to collect the whole in one large vessel, into which the sink pipe may run, and precipitate from time to time by means of liver of sulphur, as described in p. 50 of the present volume. Nitrate baths, or other silver solutions which may have become useless from any cause, may be precipitated in the form of chloride, by means of common salt. The chloride, after being thoroughly washed and dried, must be added to thrice its weight of a mixture of carbonates of potash and soda. This is placed in a Cornish crucible, and placed in a kitchen fire, the heat of which must be raised to a bright redness by means of a bellows. On allowing it to cool the silver will be found in a button at the bottom of the crucible. Various other methods of reducing silver from waste solutions have been given at different times in our columns.

Rectification.—The process of purifying alcohol and freeing it from water by repeated distillations.

Rectified Spirit.—The term rectified spirits of wine is usually applied to alcohol containing 13 or 14 per cent. of water, and having a specific gravity of about 0·835. To render this spirit absolute it is redistilled over quick-lime.

Reduction.—The process by which a metal is brought from its combinations into a metallic state. Development is a reducing process. All developing agents act in virtue of their affinity for oxygen by removing which from metallic salts, the metal is reduced into the metallic form. In all cases alkalies facilitate reduction, whilst acids generally retard the operation. The salts of iron are the most energetic reducing agents used in photography, the sulphate of iron being most energetic, and the nitrate least so. Next in energy is pyrogallic acid, and the most feeble, gallic acid. A variety of other substances have reducing properties, but are not sufficiently active to be useful in photography.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 14th August, 1861.

The flutter of excitement caused by the promised "revolutions in photography," so far from being subdued, becomes stronger every day. The prospect of being able to dispense with nitrate of silver, and of working with clean hands, is, of itself a fact calculated to inspire enthusiasm; but when coupled with the fact of complete emancipation from the snares of the abominable hypo, and the costly toning solutions, is sufficient to excite a photographic fever during these dog-days. At present, the oracles remain dumb; that they must and will speak soon, is absolutely necessary to the welfare of the photographic world. Our expectations have frequently been raised to a very high pitch, but never to the degree they have now attained. We slake our thirst as the cup of Tantalus; but if we again be deceived in our hopes, cheated in our expectations, a hard fate awaits those who have trifled with us—certainly, nothing less than having their names deeply cut on the "column of infamy." whereon are inscribed the names and offences of those who have deluded their fellow mortals.

M. Wilhorgne proposes the following method of toning and fixing positives without the use of salts of gold. He bespeaks for it simplicity of execution, great economy, and complete permanency, besides rich violet black tones and complete purity in the whites.

Five baths are, however. necessary in this method; but this must not deter the amateur from essaying a trial, as they are by no means costly. The *first* consists of a solution of hyposulphite of soda, of the strength of 20 per cent., which is saturated with chloride of sodium (common salt). This solution is always filtered before using, and a pinch of whiting is to be put into the filter. The *second* bath consists of filtered rain-water, five pints; pure carbonate of lime (whiting), one ounce. The *third* bath is composed of filtered rain-water, 100 parts; iodide of potassium, 2 parts. If filtered after each operation this bath will keep an indefinite time. But if it loses the power of yielding its primitive tones, it must be strengthened by the addition of fresh iodides, or a new bath be made. The *fourth* bath does not require to be filtered; it consists of—

Rain water	... ...	7 ounces
Hyposulphite of soda	...	45 grains
Chloride of sodium	...	15 grains
Pure sulphuric acid	...	2 to 3 drops (not more.)

The *fifth* bath is composed of rain-water 1 pint, saturated with common salt, and camphorated spirits of wine, 4 drachms. The mixture is filtered; the matter that remains on the filter must not be removed, as it serves to saturate the liquid with camphor.

The method of proceeding is as follows:—

1st. The proof in being removed from the printing-frame is immersed in bath No. 1. for 15 or 20 minutes. As in other methods, it is necessary for the proof to be somewhat over-printed, as it becomes weaker in the baths.

2nd. The proof is next rinsed, on both sides, in five or six waters, being stirred about well in each for five minutes. This operation must be very carefully performed, and must occupy not less than half an hour.

3rd. The proof is then placed in bath No. 2 for five or six minutes, then rinsed in several waters, and dried between folds of blotting-paper.

4th. When dried the proof is placed for a quarter of an hour in bath No. 3.

5th. Again dried, *without washing*, in blotting-paper, kept for this special purpose; it is then placed in the bath No. 4 immediately it assumes a milky aspect from the addition of the sulphuric acid.

Its continuance in this bath will vary more or less, according to the strength of the positive; but under the most favourable circumstances it will be from four to five minutes *at the most*. If this limit be exceeded, the strength of the solution will destroy the blacks, and make the paper tender.

As a general rule, about six or eight seconds after the blacks have visibly changed, the bath-solution must be thrown away. It can only be used once, but two or more proofs may be fixed and toned in it at the same time, the fewer, however, the better; as it costs little or nothing, a fresh bath for each operation is no object. The solution may be kept in a large stock-bottle, and when poured into a dish, the sulphuric acid be added at the moment required, taking care to agitate the solution upon the addition of the acid.

6th. After throwing the bath away, fill the dish with water, and leave the proof in it six or eight minutes. After it is well washed, leave it for half an hour in bath No. 5, then rinse it in soft water, and hang it up to dry.

All these operations should be performed out of the influence of white light.

The nitrate bath must be maintained at a strength of 25 per cent., and it is advantageous to add a few drops of nitric acid to it when prepared. If the drying of the proofs be completed before a clear fire they acquire more vigorous tones.

Evidently this is but a variation of the sulphur toning process; it remains to be seen what advantages it offers in its greater complexity.

PHOTOGRAPHY IN GERMANY.

Elberfeld, 5th August, 1861.

Dr. Schnauss, in pursuing his interesting remarks on the harmonization of photographic solutions, says:—"The amount of bromide of cadmium may be augmented in winter, in a dull light, or when operating with an old silver bath." For this purpose we prepare a strong solution o bromide of cadmium in alcohol of 9°, and add some drop of it to the ordinary iodized collodion, when necessary This is most useful when the collodion is some months old· and is red from free iodine. An excellent collodion is obtained in mixing such an old collodion with some fresh one; then it gives very clear and vigorous negatives. Reproductions of engravings, &c., are made with the old collodion alone, but then you must develop with pyrogallic acid instead of sulphate of iron, in order to obtain a white paper ground in the copy. Nothing is more difficult than to photograph a large sheet of white paper and to make a copy of this negative which is like to the original in purity and whiteness.

There is much difference of opinion respecting the effect of bromides in the collodion; some photographers think they have no effect whatever upon the sensitiveness, others believe the sensitiveness is *diminished* by this addition, and a third party think that for a good sensitive collodion an addition of bromides is indispensable.

This difference of opinion may depend upon the fact that some operators hold the obtaining of dense negatives as equivalent to greater sensitiveness; but this is an error, because the dense blacks only depend upon the development, not upon the sensitiveness of the film. Dr. Schnauss believes that film to be more sensitive which gives in the shortest time under the first, *i.e.*, the iron developer, a proof independent whether the blacks are dense or not. With a good bromo-iodized collodion the blacks are easily obtained by the following strengthening by pyrogallic acid and silver.

By adding some acetic acid to the nitrate bath the effects of the bromides are reduced, and may be quite neutralized.

When you augment the amount of iodide of ammonium and diminish the proportion of bromide of cadmium, you obtain denser blacks, but a part of the sensitiveness is lost. Prepare the four following samples:—

1. Iodide of ammonium	... ...	20 grains
Iodide of cadmium	... ...	10 ,,

dissolve in half an ounce of alcohol (90°) and add two ounces of collodion.

2. Iodide of ammonium ... ... 20 grains
Bromide of cadmium ... ... 10 „
Dissolve and add as above.

3. Iodide of cadmium ... ... 20 grains
Bromide of cadmium ... ... 10 „
Dissolve as above.

4. Iodide of ammonium ... ... 20 grains
Iodide of cadmium ... ... 5 „
Bromide of cadmium ... ... 5 „
Dissolve as above.

After eight to ten days try these collodions with a good working nitrate bath and iron developer.

No. 1 is the most insensitive one, but gives dense and clear proofs. Colour dark yellow.

No. 2 shows a too great proportion of bromide, the negatives are full of detail, but the blacks not dense enough.

No. 3 gives flat solarised proofs, and does not flow over the plate, because it contains only metallic salts. It remains colourless for many weeks.

No. 4 is the best of all, only it contains a too large proportion of bromide. After some weeks it becomes better; also when adding some drops of acetic acid to the nitrate bath it works very perfectly.

Now we come to the harmonization of the nitrate bath. In order to obtain vigorous negatives with it, I think, it should contain no free *nitric acid.* For direct positives, also for paper prints, nitric acid is indispensable. The negative bath should be prepared with alkaline, melted nitrate of silver and contain some acetic acid, in this case a small quantity of acetate of silver is formed. Then the bath is saturated with iodide of silver, exposed to daylight and filtered. After being in use a short time it will work excellently. Dr. Schnauss uses the proportion of one part of nitrate to 12 parts of water.

With a fresh bath an old yellow collodion should be used. If the proof show some fogging or want of density, add yet six to ten drops of acetic acid to the bath. No diminution of sensitiveness is remarked by this addition when working with bromo-iodised collodion and iron developer.

Dr. Schnauss believes that an iodised collodion which has been in use, *i. e.*, which has been poured off the collodionized plate, is better than a quite fresh collodion which has *never* been used.

With a freshly prepared iron solution no dense, clear, and pure negatives can be developed. The best plan is to make a four to five pounds of saturated solution of sulphate of iron, and to add some drops of sulphuric acid. Out of this bottle one fills one quarter of the operating bottle, adds three quarters of rain water, and so much acetic acid, until, after a good shaking, the fluid smells acid. A little too much acid is of no importance. The solution, when it has become yellow from the formation of acetate of iron, is in its best working state. When necessary one may also add a small quantity of alcohol, to facilitate the flowing over the plate, but with alcoholic collodion this is not necessary.

Regarding the effect of bromides in collodion, which Dr. Schnauss speaks of, I think the whole difference of opinion depends upon the kind of development. With iron developer the bromo-iodised film is more sensible than with the pyrogallic acid. The latter has not enough force, it seems to be too weak to bring the picture out as the former does. I quite agree with Mr. Hardwich's remarks upon this subject in his "Manual."

Some days ago I made a very interesting photographic tour in the beautiful vale of the Lenne, in order to photograph tunnels, bridges, and other wonders of a not yet opened railway. Arrived at the first station I found a locomotive at my disposal. I had some dry plates with me prepared after Mr. Petschler's dry process. They were immediately developed in the inner part of the tunnel, and proved to be very excellent, only the first one having had too long an exposure. I used M. Dallmeyer's Triplet Lens, No. 2, and gave an exposure of six to eight minutes.

I was induced to use the dry process mentioned by a visit of the inventor, Mr. Petschler. He had some plates prepared in England, and exposed one here in order to show me the development. The plates require more time in preparation than the Tannin plates, but nevertheless I prefer now M. Petschler's plates. With alcoholic collodion they seem also to be more sensitive than the Tannin plates, and the film is more perfectly attached to the glass plate.

Paul E. Liesegang.

HARMONIZATION OF CHEMICALS.

Sir,—Having lately amused myself by trying the dry gum process of Mr. Sisson, and finding the disposition to fog mentioned by yourself, it struck me that as there can be no effect without cause, I would endeavour, as far as my knowledge would permit, to ascertain the cause.

On testing my chemicals, I found the collodion possessed an *acid* reaction; the sensitizing bath; *ditto*, the gum solution, slightly *alkaline.* here it struck me, reasoning from analogy, that I had found the true cause of the difficulty. I will tell you, Mr. Editor, why I come to this conclusion, as I believe it will be found a common cause of failure in *all* processes.

If we proceed to take pictures by wet collodion simply, we have lately a high authority for asserting that the collodion *must* be *acid*; the sensitizing bath to work with any certainty must also possess a slightly acid reaction; the developers, we know, must contain acid: here we have a certain amount of uniformity throughout the process. Again, let us take a printing process, the ammonio-nitrate; the best papers are foreign ones, possessing an alkaline reaction, most operators in this process prefer ammonium for the salting solution; the gold bath should be at least neutral, if not slightly alkaline; fixing bath, ditto: here again we see the necessity of a similar amount of uniformity to ensure success. With the albumen papers the same necessity for neutrality or slight alkalinity throughout may be traced; many of the failures with the new gold bath, no doubt, arising from acidity in the papers or in the sensitizing bath. Some operators advocating the use of acids in these preparations.

Again, let us return to the wet process for negatives; if we take a plate, coat it with collodion (usually having an acid reaction), dip it in a *neutral* silver bath, develop with the ordinary developer (that is, without an extra addition of acid), and see if the negative does not have the fog, that makes it so difficult to use a neutral bath with any satisfactory result; it is no answer to tell me that many operators do use a neutral bath successfully with the other chemicals in their ordinary condition. I ask how do they know the bath to be neutral? surely, not by the litmus paper test? I have no faith in their ability; the test very delicate reactions by such means, and I believe that if we possessed a more delicate test for acidity or alkalidity we should find that what they consider to be neutral would really prove to have a slightly acid reaction but requiring a more delicate test than any we at present possess. May we also trace the beneficial action of gallic acid on dry plates to the fact of its restoring the balance previously displaced by the alkaline preservatives, such as albumen, &c.? I merely give this as a possible solution.

Another word, sir, regarding the test papers. I think any one who has had experience, and observed accurately, will agree with me that litmus and turmeric papers are very coarse tests for chemical reactions. I do not consider myself a chemist, although I am partial to the study; but I assert that test papers will merely show that a solution is *decidedly* acid or alkaline, and that they are almost useless where exceedingly delicate reactions are necessary. I do not know, sir, if you will consider these observations worth a place in your valuable journal; but I firmly believe, that I have indicated so common a cause of failure, that it should be impressed on the mind of every photographer or scientific man, that, in giving the public any description of success or failure, whilst giving the minute details, he should also take a broad view of the necessity of harmony or unity in every part of his process.—I am, sir, yours respectfully, E. E. L.

[It is quite possible that the suggestion of our correspondent regarding the cause of the occasional tendency to fogging in the Rev. J. Lawson Sisson's process may be correct, and that a more acid bath, a more acid collodion, or the addition of a trace of citric acid to the preservative might prove a remedy. We think he overlooks the fact, however, that it is a proper balance, or harmony, which is required in the chemicals; not uniformity of condition. If the collodion be neutral, the bath must be acid; the more nearly neutral the bath, the more decidedly acid should be bath or developer. In printing, the silver bath gives best results when decidedly acid, although the paper inclines to alkalinity, and the toning and fixing must be alkaline or neutral.—Ed.]

STEREO EXCHANGE CLUB.

Sir,—I, like your correspondent "Stereo," am one of the discontented members of the Stereo Exchange Club, and, like him, long for an alteration in the rules and method of working. Some of his ideas are certainly very suggestive; and I have ventured to trouble you with my own views on the subject, so that we may, if possible, make a fresh start.

I would begin by suggesting that a secretary be appointed by you from the names of those gentlemen who will volunteer their services for twelve months.

That each gentleman desirous of joining the club send in his name to the secretary, accompanied with twelve postage stamps for twelve months.

That during the first week of every month members desirous of exchanging prints forward to the secretary not less than three or more than six good prints.

That during the last week in every month the secretary shall forward to such members the same number of prints of similar quality and subject as those received.

That in the event of any member's prints not being equivalent in value, photographically or otherwise, with those received from other members, they be returned to him with an intimation to that effect.

The result would be that, if a member pleased, he could make six dozen exchanges each year, or less if it so pleased him; the surplus pence to pay for envelopes, &c.

All that would be required from the secretary would be strict impartiality in making the exchanges, and in selecting and rejecting prints.

These exchanges to be made quite irrespective of any that may have been made previously between gentlemen of the club; and any member, wishing to avoid receiving duplicate prints, to forward a list to the secretary of what he already possesses.—I am, sir, yours respectfully,

A Volunteer Secretary.

August 12, 1861.

[We shall be glad to hear further opinions on this subject. The propositions appear most sensible and desirable.—Ed.]

Photographic Notes and Queries.

India-Rubber for Baths.

Sir,—I was much surprised on looking over the News of to day, to find that the invention of india-rubber baths is attributed to Mr. Francis. If you will refer to your number for the 15th of February, 1861, you will there find my full description of the mode of making india-rubber baths, and also a suggestion for a wooden bath, lined with india-rubber. In my description you will find that I have made a remark to the same effect as yours of to-day, namely, that "pure india-rubber is without action on the solution of nitrate of silver, and may be used safely." Hoping you will find a corner for this, I am, sir, truly yours, Leo Daft.

2, *Queen Square, Westminster, August 9th*, 1861.

[We are at all times unwilling to rob any member of the photographic commonwealth of the credit of any suggestion he may have contributed to the public stock, as that credit is the only reward for so much that is freely imparted. In noticing Mr. Francis' baths, we did not give him credit for the first use of india-rubber for baths; but for having made a very simple and efficient application of it as a lining to wood. Our readers will remember the valuable letter of our correspondent on the subject some months ago.—Ed.]

Miscellaneous.

Photographic Micrometers.—Dr. Wood, writing to the *Philosophical Magazine*, referring to the subject of photographic micrometers, regarding which a paragraph, copied from one of our American contemporaries, appeared in our pages a few weeks ago, stating that photographic micrometers had recently been constructed by Mr. C. Morfit, of New York, remarks:—"I have been for the last month, or so, engaged occasionally in making experiments with the same intention as an original idea. I send you a short account of what I have done for publication, if you think it sufficiently interesting.

"My endeavour was to get a glass slide for a microscope, marked so as to measure very minute objects; and as the micrometer I have (measuring 1-100th of an inch) was useless for the purpose I had in view, it occurred to me that by the diminishing power of the camera I might succeed in obtaining smaller divisions. I tried first for pictures of dark lines, 1-16th of an inch in breadth, on a white ground, reduced to a small compass, but I did not succeed, even with a very small aperture to the lens. I then substituted lines 1-4th of an inch in breadth removed to a greater distance, and I got a pretty sharp picture; but I found that the sharpest and best-marked picture of distant lines I obtained was given by opaque bars, placed so that the light from a clear sky came to the camera between them.

"By nailing rods of blackened wood, 1-4th of an inch broad, and 1-4th of an inch asunder, across a frame, and placing this at a suitable distance, with a clear light behind, and using an aperture of about 1-8th of an inch in diameter, I easily obtained well-marked and sharp lines, the 1-1000th of an inch apart, and the 1-1000th of an inch in breadth, sufficiently accurate for all the purposes of a micrometer. The picture of the lines requires to be covered with transparent varnish to prevent rubbing. I have taken the picture on very thin talc, and cemented it to glass, with the collodion between the plates; and for object-glasses of small power I have found it answer, but the thickness of the talc is too much for the higher powers, as the object viewed and the lines do not sufficiently agree in focus.

"I suppose the reason why lines, with spaces between them, give a better picture than black lines ruled on a white ground is, because there is no irradiation of light from behind, at least not nearly so much from the spaces as from the white ground. At all events, whatever the cause may be, I have found the lines with the spaces give a much better and sharper impression. The picture of the lines should be a positive one, and very clear. I found the collodion prepared with the iodide of iron, according to the formula given in this *Magazine*, July, 1854, to act admirably. It must be very sensitive, on account of the smallness of the aperture necessary for the required sharpness. I have no doubt that much finer lines than these I have got might be obtained by the same process."

Gun Cotton.—Gun cotton is a material for which we have no satisfactory test but the actual trial. We cannot tell if it will dissolve or no till we try it, we cannot tell if its solution is fit till we use it.

One of the strangest facts about pyroxyline is, that it is utterly insoluble in ether or alcohol separately, while if the ether and alcohol be mixed, it melts away in solution rapidly. This fact is anomalous, and, as far as I know, has not a parallel.

How admirable is the mixture which we call collodion, for our photographic process. I believe if the wisest man had been required to name the properties of the great desideratum, he would have given the description which could apply to nothing but collodion. He would have said, let a fibre-like cotton, insoluble in water, be dissolved in a liquid which dissolves also iodide of potassium. The solvent must be volatile, and must be unaffected by nitrate of silver. Twenty years ago such a combination was as far beyond reach as the *elixir vitæ*. The problem is now fairly and practically solved, but it is only the expert that are able to make the happy combination in all its perfection.

There are lately found other solvents than ether-alcohol of gun cotton, namely, aniline and nitro-benzoin. And I think it likely that pyroxyline will dissolve in all of the nitro-hydrocarbons. Here is a promising and unexplored field for research. Perhaps we shall discover a new collodion! Let some one try to resolve the scientific mystery of gun cotton.—*American Journal of Photography.*

Talk in the Studio.

The Tannin Process.—Mr. Russell's long-promised treatise on the tannin process is out, and has just reached our hands. Instead of a mere tract, as some may suppose, it is a respectable volume of 80 pages, entering very fully into every point of minutiæ. We shall devote more space to an account of it in our next.

Plate Holder for Developing.—We have received from Mr. Solomon a plate holder he has just brought out, for holding the plate during development. We have seen and tried a variety of contrivances for this purpose, but the one before us entirely eclipses in simplicity and efficiency any we have before met with. It consists of a shank of stout silver-plated wire, at one end of which is a ring which forms the handle; and at the other, a fixed gutta-percha rest or shoulder. Opposite to this is another shoulder of gutta-percha, which slides along the wire. Stretched over the fixed and the moveable shoulder is a vulcanized india-rubber band. In each piece of gutta-percha is an aperture, so that when a plate is placed with one corner in each gutta-percha rest diagonally, it only touches at the extreme edges. The plate is held firmly in this position by the india-rubber band, which by its elasticity holds with equal facility any size, from a quarter-plate to a whole-plate, or larger. The contrivance is light, compact, efficient, and cheap, and will completely realize the possibility of photography with clean fingers.

The Photographic Nuisance.—The public have been generous patrons of the photographer. The photographer, in his turn, has done much towards the education and refinement of the people. But we hardly care to pass our lives before the truest camera. We cannot consent to be sitting for our portraits from sunrise till sundown. We protest, therefore, against a street nuisance, born of photography. It offends us at every turn; it dodges us at every corner. Ruthless fellows of savage exterior, thrust black portraits under our nose in every street, and have, now and then, a sneer or an impertinence for the passer-by who declines to follow them up to the glass-house, where "the artist" officiates. We have been compelled to touch upon this subject by the outrage a woman has recently suffered at the hands of some of these importunate photographers, because, forsooth, she ventured "to hint a fault and hesitate dislike" when she was supplied with her portrait. People will hesitate to risk the taking of even the cheapest portrait, if the bargain is likely to include a black eye.

There is a story told of a tradesman who vowed that he could not be civil to everybody. But we shall presently have a set of portrait-hawkers who will find it difficult to be civil to anybody. —*Lloyd's Weekly News.*

To Correspondents.

Toning.—We have generally succeeded perfectly with every formula of gold toning we have tried, using, in conjunction with the gold, phosphate, carbonate, acetate, and citrate of soda, and also Legray's formula with chloride of lime. The mottled, mealy, grey effect in the print you forward, is very troublesome; we have at times met with it, and have often heard of it. The cause is difficult to determine certainly. It is more common with some samples of paper than others, but it is not always necessarily the fault of the paper. When we have met with it we have been somewhat disposed to attribute it to the washing water before toning containing carbonates, which precipitated a carbonate of silver in fine patches, some of which adhered very firmly to the surface in this mottled manner, preventing toning in these parts, whilst other points were being over-toned. But we have not met with it sufficiently often to say that this is the reason; nor do the best remedies we know confirm this view. Amongst the skilled practical operators we know, there are several who have entirely got over this difficulty by using acetate of soda in the gold bath. The proportions stand thus: chloride of gold, 15 grains; acetate of soda, 7½ drachms; water, 35 ounces. See also Mr. Elliot's recent paper in our pages, "The Measles: its Diagnosis and Cure."

B. K.—A report on your glass in our next.

J. J. A Constant Reader of the News.—A positive which has just received the proper exposure, and no more, will not make a very good negative. However, proceed as follows: make a solution of two grains of iodide of potassium and one grain of iodine in an ounce of water. Wet the film of the picture to be strengthened, thoroughly, and then cover it with this solution and leave it on for a few minutes in the light. Now wash again thoroughly, and develop in the dark room, with pyrogallic acid 2 grains, citric acid 1 grain, in one ounce of water, adding to this developer a few drops of 20-grain solution of silver. When sufficient intensity has been gained, wash and dry. Or, instead of this method, after wetting the film, pour on a solution of bichloride of mercury three or four grains to the ounce, leave it for about a minute, wash well, and then pour on a solution of iodide of potassium one grain to the ounce, which will turn the picture a greenish yellow, then wash well, dry and varnish. Whichever plan you adopt try it on a waste plate or two first, to make yourself familiar with the reactions before you risk it on a picture you value.

Thos. Llewellyn.—Dallmeyer's triple achromatic lens consists of two achromatic meniscus lenses of different diameters and foci, with a double concave achromatic lens between them. The form of your half-plate lens is that usually adopted for portrait lenses. The terms "actinic focus," and "chemical focus" have the same meaning, and they are distinguished from the "optical focus" by the fact that in lenses not corrected so as to have their optical and actinic foci coincident, the actinic rays of light do not come to a focus at the same point as the illuminating rays, and the focus as seen, is not that at which there is chemical action. If these answers do not clear up your difficulty, write again, but to answer you fully would really require an elementary treatise on optics. Dicks' "Practical Astronomer," if our memory serve us correctly, was about 7s. We believe it is out of print.

A. A.—We have not met with such markings before. They appear from their form to arise from turbidity of some of the solutions which have been poured on the plate, but whether in the preparation of the plate, or its development, it is difficult to say. We have seen somewhat similar markings, but not so numerous or quite of the same form, on developing a dry plate, from the vessel holding the solution not being quite clean, causing the developer to become quickly turbid on adding the silver, which become deposited in irregular spots on pouring it on the plate. The general character of the negative is faulty, and seems to indicate alkalinity somewhere.

F. J.—The oily appearance of the plate in the nitrate bath may proceed from two causes, or a combination of both. If the bath be an old one it arises from an accumulation of ether and alcohol in it, and may be got rid of by placing the solution in an open vessel in a warm place, to evaporate part of the excess of ether and alcohol. It more probably proceeds from the collodion, the pyroxyline having been made at a low temperature, and giving a film which is horny and repellant of water, or containing much anhydrous spirit. In this case a drop or two of distilled water to each ounce of collodion will probably cure the evil. 2. The loss of tone on placing the print in the hypo bath often arises from faulty paper, and indicates weakness in the salting solution with which it was prepared. The only plan is to change the paper, or in using the same, tone a little deeper. A freshly made hypo solution is most apt to produce the effect. It will not be so bad after a few prints have been fixed and partially satisfied the propensity the hypo possesses of attacking the gold. Take care, however, that your hypo does not become acid, and also not to continue its use until it is quite exhausted. See Mr. Eliot's two recent communications on this subject.

T. Y. K.—You are giving excessive over-exposure. In copying prints it is generally a question of seconds rather than minutes unless you are using a very old collodion and very small stop in the lens. The collodion you are using is not well suited to the work; you should have an old intense collodion of the colour of brown sherry. If you then do not get sufficient density, you can further intensify with bichloride of mercury. A negative of an engraving should generally have a few points to represent white paper, quite black and opaque, and the deep shadows almost bare glass.

M. H.—It is difficult to state absolutely the comparative value of different lenses without careful comparative trial. As regards the question of straightness of marginal lines, however, there cannot be a moment's doubt of the superiority of the triple over those you name, or indeed over any other landscape lens, and we think its advantages are as marked in the 6 by 5 lens as in any other size. We use one of that size, and regard the definition as most perfect throughout, and its action decidedly rapid. We should decidedly prefer it to those you name; but how far it is worth while, possessing those, to procure this, must be a question for individual judgment.

Five Months.—1. The deep shadows under the eyes in your portraits, taken in the open air, arises from the excess of vertical illumination. The light comes direct upon the head, and the forehead and eye-brows cast shadows underneath the eyes. Erect some kind of canopy, so that the sitter is protected from the direct top light. 2. Portraits cannot be taken by gas light. 3. The defect you name is, we believe, incident to the process. Try the Fothergill process.

James Tulley.—We think we have seen the picture you name, but as we have not access to a copy for examination, and do not remember it accurately, we cannot speak definitely about the matter. You must remember, however, that a photographer may be highly skilled in the studio; but quite at a loss in work out-of-doors. We do not regard the firm you mention, as producing first-class work.

J. C.—We do not quite understand the kind of markings to which you refer. An excess of water in your collodion may produce markings in two ways; either by causing craping and reticulation, or by making it so gelatinous that it gives an uneven layer full of small inequalities or lumps. The former you may remedy somewhat by allowing the film to set well before immersion in the nitrate bath. If it be from the lumpy inequality, the addition of a little more ether will mend the matter. The use of a more powdery pyroxyline will of course prevent gelatinization and uneven film; age, and the use of an alkaline iodide, will have a similar effect. Mr. Davis uses the raisin extract in connection with albumen. We have tried it and found it excellent. We think it better for the purposes than the sugar syrup: if the latter be used it should be considerably more diluted. 2. The best book for reference is Hardwich's Manual.

H. Cooper, Jun.—We will write to you.

F. S. Beatty.—We will write to you in a few days.

H. R. Nichols.—We shall look with interest for the results of your experiments when they are brought to a successful termination.

R. J. P.—It is very difficult to succeed in albumenizing paper without producing streaks. It requires much experience and skill in manipulating to succeed always, and some papers are more difficult to manage than others. The difficulty is of course much increased, if you use pure albumen without dilution with water. What is required is greater limpidity. The addition of acetic acid certainly increases the limpidity; but whether it will in all cases prevent streaks or not, we cannot say. We cannot give you any other information as to the means of avoiding these streaks than that which we have before published.

M. D.—The objections to using a 12 by 10 lens with a 7½ by 5 camera, are, in the first place, that the focus of the larger lens would be double the length of the small one, and the body of the camera could not, with any convenience, be made to draw out so far. The proportion of the objects and the amount of subject included by a large lens, on a small plate, would often be clumsy. 2 A single view lens may be used for copying, but the field is not flat, the lines are curved, and the definition is often imperfect. The triple lens is best for copying.

T. P. E.—In our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 155.—*August* 23, 1861.

ROYAL PATRONAGE OF PHOTOGRAPHY.

Every photographer is aware that both Her Majesty the Queen and the Prince Consort have at all times exhibited a lively interest in photography, and that the Photographic Society of London is under their direct patronage. It has even been whispered that the royal fingers have not unfrequently been impressed with the universal insignia of the votaries of the art, the inevitable black tips. However that may be, it is a highly gratifying circumstance to record, in connection with Her Majesty's patronage of the art, that it is always marked by a most discriminating appreciation of excellence, and that the men photographers generally are proud to own, are the men Her Majesty delights to honour.

In London it is from amongst photographers admitted by the universal consent of their *confréres* as in the first rank, that selection has been made. Such men as Williams, and Kilburn, and Lake Price, and Mayall, and Southwell have been summoned at different times to the Palace, and in some instances have been permitted to publish the results of their labours for the gratification of the community at large. At Balmoral the nearest resident photographer of ability—one recognized unhesitatingly by photographers as amongst their best men—Mr George Wilson of Aberdeen, has repeatedly been commissioned by Her Majesty. Now we have to record that Mr. Lacy of Ryde, to whose exquisite pictures we have more than once called attention, has been summoned to Osborne to produce *carte de visite* portraits of various members of the Royal Family.

We cannot but regard the publication of these photographic portraits as a happy thought on the part of Her Majesty, and as at once calculated to stimulate and gratify the proverbial loyalty of the people of England, whilst it evinces on her part that desire for a place in the hearts and memories of her people, which Shakespeare renders as so finely characterizing a monarch centuries ago, who enthusiastically exclaims—

> "Then shall our names,
> Familiar in their mouths as household words,
> * * * be freshly remembered."

In a recent visit to the Isle of Wight we had the pleasure of inspecting the negatives and early proofs of the pictures taken by Mr. Lacy at Osborne. Amongst these were portraits of the Crown Prince Frederick William of Prussia, and the Crown Princess (Princess Royal of England), and their two children, the Prince William and Princess Charlotte, and also the Princess Beatrice, together with several ladies and gentlemen of her Majesty's and the Crown Princess's suite. The portrait of the Crown Princess in a group with her husband the Prince Frederick William, is by far the happiest we have seen. The group itself is an elegant little composition, but the portrait of the Princess is so simple and graceful in *posé*, so sweet and winning in expression, that we have rarely seen a more charming picture, or one which does so much justice to its original. After this, by far the most attractive picture is the portrait of the young Prince William of Prussia, a handsome boy of two years and a half old, in the traditional costume of a true British tar, and looking every inch the character. Had this been the portrait of some infant dramatic prodigy enacting the various characters of T. P. Cooke with great success, we should have regarded it as a miracle of clever acting. The loose shirt and large collar turned over a cravat, which is slung rather than tied round the neck, the loose trousers, tight above and flowing below, and sailors' hat stuck on the back of the head, complete the costume. The figure is poised on one leg, whilst the other foot rests on its side, giving a slightly heeling effect. The hands are in the trouser pockets, one being thrust deeply down as if in search of the last stray sixpence; the position of the head and general expression lending countenance to that idea, and giving an irresitible piquancy to the whole picture. These, with several other interesting portraits, Mr. Lacy has received Her Majesty's permission to publish, and they will shortly be ready for distribution.

Mr. Mayall has also just announced that his recent series of the Royal Family are now ready for publication. We had the privilege, some months ago, of seeing the early impressions which had just been submitted to Her Majesty's inspection. They far exceed in interest and variety the first series issued by Mr. Mayall; the costumes, and the expressions, both being more pleasing than those in the former series. They consist of single and grouped portraits of Her Majesty and the Prince Consort, in various positions, portraits of the Crown Princess, and the Crown Prince of Prussia, of the Princesses Alice, Helena, and Beatrice; and of the Princes Louis, Arthur, and Leopold. The series is of considerable extent, and embraces some very fine specimens of photographic portraiture.

We cannot help here, in reference to the pictures we have mentioned, expressing our deep regret that the Bill for amending the law of copyright as relating to works of fine art, did not pass into an Act during the last session of Parliament. Read a second time, and committed, it was placed in the orders of the day repeatedly, and as repeatedly from some cause or other delayed, until the end of the session came, and it shared the inglorious death known in the slang of the house as the "slaughter of the innocents." The specific protection there provided for photographs, is at least delayed for a great part of twelve months longer.

Mr. Mayall and Mr. Lacy will issue these portraits with a full conviction that they will be pirated. The wrong thus done to their purses is the least part of the evil. The coarse, granular, flat, stained, fading copies which will appear—for the pirate is genarally a bungler—will in many cases be mistaken for their work, and their reputation will suffer; the art will be degraded, and the illustrious person portrayed will be caricatured. We cannot but think that the present law might be administered so as to be a protection in palpable cases; but as the cost of a trial must be heavy, the question arises "who is to bell the cat?" We believe an attempt was recently made to form a combination for such a purpose; but failed through a disposition on the part of those concerned, to thrust the chief onus on one person, who was naturally indisposed to try, at his own cost, a question in which all publishers of photographs are interested. For the present we fear that there is nothing to prevent this disgraceful piracy, but the refusal of all dealers to assist in the distribution of the stolen property.

PHOTOGRAPHY AND THE INTERNATIONAL EXHIBITION.

The correspondence between the Council of the Photographic Society and Her Majesty's Commissioners for the Exhibition of 1862, has for the present terminated; and, we regret to say, unsatisfactorily. The Commissioners have not distinctly denied the claim made by the Society for a position amongst the Fine Arts, but have, in a manner we must confess the Council have a right to regard as somewhat rude, quietly ignored the claim. Our readers are aware that in the last letter of the Chief Baron to the Commissioners he suggested that they should receive a deputation from the Society in order that the question might be fully considered. The Commissioners declined to receive a deputation, but expressed their anxiety to have a committee appointed to co-operate with them in the matter. This was deemed unsatisfactory, and on June 11th, Dr. Diamond wrote to the Commissioners informing them that the Council could not take any further step until they had ascertained the views of photographers generally on the subject. No further communication appears to have passed between the Society and the Commissioners until the end of July, when the following letters, which we find in the society's journal, were forwarded :—

Offices, 454, *West Strand, London, W. C., July* 29, 1861.

Sir,—Adverting to your letter of the 12th of June, I am directed by Her Majesty's Commissioners to inquire whether the Council of the Photographic Society are yet able to favour them with a definite reply as to the nomination of a Committee in connexion with Class 14. The Commissioners will be glad if the matter could be settled in the course of the current week, in order that they may conclude their arrangements in connexion with this department of the Exhibition.—I have the honour to be, sir, your obedient servant,

F. R. Sandford, *Secretary*.

To Hugh W. Diamond, Esq., M.D.

To this Dr. Diamond replied that nothing could be done until they had conferred with the Chief Baron, who was then absent on circuit. In a few days after the following letter was forwarded to the Commissioners :—

Photographic Society, August 8, 1861.

Sir,—The Council have no wish to dictate to the Commissioners in what form their just expectations shall be fulfilled. If the Commissioners are prepared to receive Photography as a branch of the Fine Arts, the Council are willing to appoint a Committee, and afford every assistance in their power.

But if this be not conceded, the Council cannot concur in any proceeding, the tendency of which is to disparage Photography as one of the now universally acknowledged means by which genius can perpetuate whatever is grand and beautiful in Nature.—I am, sir, your obedient servant,

Hugh W. Diamond, M.D., *Secretary*.

To F. R. Sandford, Esq.

To this, so far as we are aware, no answer has been received ; and, if we understand the matter rightly, there is an end of any hope of co-operation on the part of the Photographic Society in the arrangements of the Exhibition. " Nothing now remains," observes the editor of the Society's journal, " but to allow matters to take the natural course." What is meant by the " natural course " is not stated ; but as abstaining from contributions to the exhibition was the course before recommended in case the Commissioners declined to comply with the claims made for photography, we presume that is intended here. The suggestion is added that if photographers generally approve of the idea of holding an independent contemporaneous exhibition for photographs, promp action is requisite.

We must confess that we feel very loath to regard the matter as definitely settled thus. We shall deeply regret if photography have no representative of its interests in the arrangements of the International Exhibition. An independent exhibition we regard as a poor substitute for an honourable position in this great international undertaking; and as it is quite certain that photographers will contribute to the latter, the existence of an independent exhibition will only tend to spoil both and prevent either having a representative character. The Council of the Photographic Society have doubtless endeavoured to maintain the dignity of the art in this matter, and deserve the thanks of photographers for the attitude they have preserved throughout this matter ; but we cannot help regretting that a Committee was not appointed, who might possibly have secured, in the progress of arrangments, many advantages which will otherwise be lost. Possibly, effect might have been given to the suggestion of Mr. Sebastian Davis made at the last South London meeting, and advocated at the time by ourselves—which by the way we have been somewhat amused to see revived in a recent number of a contemporary as an original suggestion—in which he proposed that art-photography and general-photography, might each have a distinct recognition and position. An arrangement like this might, possibly, more easily have been brought about than the admission of photography generally into the fine art section.

M. Claudet, in an able letter to the Society's Journal, in which he fully endorses the position assumed by the Council and admits many of the advantages obtained by an independent exhibition, comes to the conclusion that, after all, submission to the classification of the commissioners will be the best course. He observes, that although doubtless sufficient unanimity amongst English photographers might be secured to render a separate exhibition a success yet,

" The difficulty of having the adhesion of foreign photographers from all parts of the world, ignorant of the real state of the question and of the classification decided by the Royal Commission, will perhaps leave us no other alternative than to submit to the classification, which, however unpleasant to the scrupulous and spirited photographer, cannot affect the ultimate object of the presence of photography in the palace of the Great Exhibition, which is to enable the public to judge of the present state of the art, and to compare the progress made by every nation in that most beautiful discovery, whether it is classified in the catalogue under the head of machines or fine arts.

" I hope that such an act of humility, and such a sacrifice from our part as individuals, will be understood, and that we shall come out of the International Exhibition with the greatest honour, having conquered once for all, the rank, in the acknowledged fine arts, which belongs to photography.

For the present it appears we must wait the course of events. In any case photographers have something to learn from the matter. Her Majesty's Commissioners have decided that photography is a mechanical art, and that photographs are mechanical productions. Have photographers nothing to charge themselves with in this matter ? That photography is a fine art we think there can be no room for rational doubt. But how many photographers are artists ? How many are there who know anything of the principles of art in their most rudimental forms ? Photography is undoubtedly a fine art ; but how many photographs are works of fine art ? Painting is a fine art ; but it is only so in the hands of an artist. So little attention has been given to art-culture amongst photographers, that almost the whole terminology of the art is of a mechaneal character. Is a picture very fine, the question at once asked is, " by what *process* was it produced, and with what lens ?" When a process is described, it is the *manipulations* which concentrate the interest ; and the person who practises photography professionally is an *operator*.

Amongst photographers themselves, the mechanical appliances have been often exalted over the artistic conception, and some of our most artistic photographers have pined for lack of appreciation. Let us look to it then, and whilst we maintain the art-claims of photography, endeavour to improve the art-character of its productions

FORMIC ACID IN THE DEVELOPER.

In a letter we have just received from the Hon. Major Stuart Wortley, now in Naples, he gives some details of his experience as to the effects of formic acid in the developer, which will be interesting to our readers. We may remark in passing that Major Wortley is an enthusiastic and skilful photographer, and that the very finest negatives we have seen of Indian scenery were produced by him. His opinion is, therefore, of weight, as coming from a cultivated and experienced amateur. He says :—

" Having been interested in reading the controversy regarding the employment of formic acid in the collodion process, I will give you the result of my experience with it. Working in India two years ago, I was first induced to employ formic acid in consequence of its great restraining tendency; I found it to allow the iron developer to be poured on to the film as the hottest weather without difficulty, while at the same time I found that I could obtain an equal amount of half-tone and intensity in my negative with less exposure than when using acetic acid alone.

"I am convinced formic acid is injurious in the bath, and is only of use in the developer. Since that I have, within the last two months, had an opportunity of verifying my previous experiments. I have made a careful series of experiments, and find the following the most satisfactory proportions that I have yet hit upon:—

Water	18 ounces
Sulphate of iron	200 grains
Formic acid	3 drachms
Acetic acid	4 ,,

I enclose you a print vignetted from one of my negatives, in order to give you an idea of the results; and I may mention that the negative after development with iron, is washed, cyanide applied, and then dried. I afterwards intensify, and I think you will agree with me that it is not often easy, by intensifying, to obtain such perfect gradation of tone, and, in this instance, with a very difficult subject. The statue is a copy from the famous Venus Kalipyge in the museum here, and stands, as you see, in the garden of the villa in which I am staying."

The vignetted print enclosed to us is a most exquisite picture, and equal as a photograph to anything we have seen, notwithstanding that it is, as Major Wortley remarks, a very trying subject. The white statue stands against a white background, and is surrounded by green foliage; notwithstanding which, there is the most perfect rendering of every delicate gradation in each. The statue is no flat patch, but perfectly round and relieved, giving every gradation of the modelling; every leaf is at the same time perfect and full of half-tone. The texture of the bark of a tree is quite microscopic in its exquisite definition and detail. We have rarely seen a photograph more perfect in all its parts.

Formic acid has been repeatedly suggested and tried as a photographic agent, but generally, for some reason, abandoned. It has been repeatedly recommended as an addition to the iron developer for glass positives as materially improving their tone. We used it for this purpose, experimentally, some years ago; but gave it up as tending to fog the shadows. It, unquestionably, has some reducing power, and hence we should not, *a priori*, have anticipated that it would have been valuable in restraining development. But one well ascertained fact, one successful result, is worth many speculations. That it should be added to the developer and not to the bath, there should never have been a doubt. If added to the latter, especially if it contain no other acid, fogging must result, with eventual precipitation of formiate of silver.

A FEW HINTS ON INSTANTANEOUS PHOTOGRAPHY.

There are few things more interesting to a young amateur, who has devoured with avidity several Instruction Books, than to know the actual details of manipulation, by which some specific successes of a kind in which he is interested have been produced. We have repeatedly stated that for the practice of instantaneous photography, the requisites were simply the ordinary chemicals and appliances of the best kind, and in the best conditions: a good bromo-iodized collodion; bath of pure silver, with no more acid than is necessary for clean working; iron developer, good lenses, and good light. But still we are asked from time to time for more particulars as to the production of such and such instantaneous pictures.

Mr. Harman has favoured us with a brief statement of the method used in producing the instantaneous views of London, recently noticed in our columns.

We subjoin his communication:—

"One of the first things to be considered in the production of instantaneous photographs, is to have a contrivance for opening and shutting the lens quick enough to obtain sharp pictures of moving objects. This may be managed in a variety of ways, and each photographer will probably select his own method. But by far the most difficult point to overcome is to have a process by which you can get fully detailed exposed negatives with such rapidity of exposure. The following process is always successful in my hands.

Plain Collodion.

Take—Ether ·750	8 oz.
Alcohol ·820	1 ,,

add good pyroxyline until thick enough.

Iodizer.

Take—Alcohol ·820	3 oz.
Iodide of Cadmium	54 grains.
Bromide Ammonium	18 ,,

When the plain collodion is sufficiently settled add to every 3 ounces 1 ounce of iodizing solution, shake well, and set aside for four or five days to settle, when the collodion will be ready for use.

The Bath.

"Dissolve 1 oz. of nitrate of silver in 2 oz. of distilled water, and 4 grains of iodide of potassium in about 1 drachm of distilled water. Mix, and when the precipitate is dissolved add 12 oz. more distilled water. Shake well, then add a small quantity of moist oxide of silver, until it assumes a dirty brown colour; shake again very well, and filter (sometimes it requires twice filtering to make it quite clear), then add 2 or 3 drops of diluted nitric acid until the solution give a faint acid reaction to test paper, when it is fit for use.

Developing Solution.

Water	6 oz.
Protosulphate of iron	2 drachms.
Glacial Acetic Acid	3 ,,
Alcohol	2 ,,

"Great care must be taken to have perfectly clean glass plates. When these are obtained, coat with collodion, sensitize, develop until all the detail is well out, fix (with cyanide), and wash in the usual way. When the negatives are dry, pass a camel-hair brush, dipped in spirit varnish, round the edge. When this is dry, moisten the film with water, and re-develop with strong pyrogallic solution to which a few drops of silver have been added. If sufficient intensity cannot be obtained with this, wash the plate well and pour over a weak solution of bichloride of mercury. This seldom fails to bring it up to the desired point. But sometimes it is requisite to wash again, and treat it with a weak solution of iodide of potassium. When the negative is finished, wash well and dry. Always avoid using the mercury too strong, as it often happens that it renders the negative white instead of blackening it. In conclusion, I will mention that the lenses I use were made by Dallmeyer, and in my humble opinion none better can be obtained for the purpose. Alfred Harman.

3, *Albert Cottages, Hill Street, Peckham, S. E.*

THE TANNIN PROCESS.*

Major Russell has left no opening for the dry photographer to complain of scanty information regarding the Tannin process.

Our readers have already had very clear and very lucid articles from his pen describing the process; now we have before us a work on the subject, perhaps the most complete, minutely detailed, and comprehensive treatise which has ever appeared on any single process in photography. We have rarely met with a photographer having such a method-

* "The Tannin Process," by C. Russell.—London: John W. Davies; and Liverpool, H. Greenwood.

ical and systematic plan of proceeding from the beginning to the end of all his operations, together with such simplicity and clearness in explaining them and presenting the reasons for each. The work itself partakes of the character of the science, and is pre-eminently photographic in its perfect rendering of minutiæ. We have not less than a dozen pages under the heading "Coating with Gelatine," and nearly as many more under "Coating with Tannin." This is just what a very large class of readers require. Starting as in many instances they do, without previous knowledge of, or practice in the manipulations of dry photography, they require a routine so clearly defined that they cannot err if they follow it, together with such an intelligent explanation of the reasons as removes them from the position of mere automatons in the pursuit of their art. Major Russell does not believe in hap-hazard methods of proceeding; but recognizes a right and wrong method of performing the simplest operations: the right he points out and enforces, the wrong he points out to be avoided; and he has a always sufficient reason for his election in matters so trivial that many photographers would fail to observe, still less make notes upon.

The simplicity and certainty of the process, with the excellence of the results when carefully managed, will render this little work welcome to many. In all the main points the details are just the same as those communicated by Major Russell in our columns some months ago, the present treatise being an elaboration rather than a modification of what was before published. We shall, however, for the benefit of those interested in the matter, make a hasty *resumé* of the process as now published, which we hope will tempt our readers to procure and peruse the work itself.

To commence with cleaning the glasses—which for this process, it is stated, should, unless gelatine be used, always be ground at the edges and a little way on to the surface—Major Russell discards all "cleansing liquids" which contain rouge or nitric acid, and recommends the following course:—If the glasses have been used before they have to be soaked for a short time in a warm solution of common washing soda, rinsed well, and then left to drain and dry; if the glasses are new, the soda solution is omitted, and a simple washing substituted. Afterwards they are to be rubbed well on both sides with a mixture of old collodion one part, and methylated spirit one part, brought to a port-wine tint, either by age or the addition of free iodine, mixed with tripoli. Before use, it is always to be shaken up and then allowed to subside a few seconds, so that the heavy coarse particles which might scratch the glass may settle to the bottom of the bottle, and not come in contact with the glass plate. After being rubbed with this mixture and a piece of cotton wool, the plates are set aside until several are so treated; after which, they are placed in the screw holder, and the collodion mixture polished off with a rubber, made by cementing a piece of felt on to a large cork. After this they are to be further polished with another rubber made by covering a piece of wood with several thicknesses of flannel, and then with cotton velvet. Finishing with leather is altogether tabooed. This is a very brief abstract of Major Russell's instructions on this part of the subject.

Considerable stress is laid on the advantages and simplicity of the coating of gelatine applied as a couch for the collodion, and the minutest instructions given for efficiently conducting the operation. The advantages claimed for the gelatine coating are, that it not only prevents blisters and the film leaving the plate in developing, fixing, &c., but that it gives much greater certainty of clean negatives; and by masking slight scratches and defects in the glasses, prevents the waste of many which would otherwise be useless. The strength of the gelatine solution recommended may be from two to five grains to each ounce of water, with one drop of glacial acetic acid for each grain of gelatine. The object of the acetic acid is to coagulate and collect into filaments, which may be removed by filtration, a certain white opaque impurity present in all samples of gelatine, and of which it is very desirable for this purpose to be entirely free. A drachm of alcohol is added to each ounce to prevent decomposition. The strength of the gelatine solution, varying as we have said, from one grain to five, is to be regulated by the thickness of the collodion: a weak solution is sufficient for a thin collodion, but would be apt to loosen from the glass if a thick strong-bodied collodion were used, under such circumstances; therefore, a stronger gelatine solution is necessary: and it is recommended that, in coating with gelatine and with collodion, the solution may in each instance be drained off the same corner of the plate, by which means the thickest portion of the collodion film will be supported by the thickest part of the gelatine coating.

The chapter on this kind of collodion will be read with considerable interest. It is a singular and somewhat puzzling circumstance, however, that whilst the originator of the process attaches tho utmost importance to the advantages of a large quantity of bromide, Mr. Sutton, one of its most enthusiastic advocates lays it down as one of the primary conditions of success that no bromide whatever is to be used. In our own experiments we have certainly observed a marked improvement in delicacy and softness, as the result of the presence of bromide; and Major Russell intimates that the improvemeut may be distinctly observed by every addition of bromide, uutil it reaches as much as three grains to every five of iodide in an ounce of collodion. Regarding the collodion generally, and the bromides particularly, the major shall speak for himself. He says:—

"Almost any collodion will produce good results with tannin if properly managed, no matter how new and horny, or how old and rotten. Even should it be too old or too new to work well in tho wet process. it will still succeed. Some difference will, however, be found in the character of the resulting pictures, though not so great as in the wet process, and there will bo a great differeuce iu the sensitiveness. A new collodion is tho most sensitive, and in the writer's hands gives the proper red tone and vigour of negative perfectly, provided a strong solution of tannin be used. An old and powdery sample, on the other hand, even if rendered colourless by cadmium, besides being very insensitive. gives a palo grey image, which will not develop with quite so much vigour and richness or tone, and the film when varnished is soft and liable to injury, whereas that produced by a new and horny collodiou is, in harduess and durability, only inferior to albumen. A tolerably opaque film is advantageous, but not so necessary as iu other dry processes; plates prepared with tannin being little liable to solarization. Opacity should not be obtained by over-iodizing the collodion, but by using a thick sample.

"Simply iodized collodion may be used, but the preseuce of bromide greatly increases sensitiveness, intensity, and facility of development. Any collodion which is sensitive and gives good results in the wet process may bo rendered suitable for use with taunin in the following manner:—Dissolve sixteen grains of bromide of cadmium and four grains of bromide of ammonium in one ounce of alcohol s.g. ·805: if tho collodion is not iodized, mix three parts of this solution with five parts of the iodizing solution, and to one part of the mixturo add three parts of plain collodion. If the collodion is already iodized, add three parts of plain collodion to ono part of bromide solution, and mix three parts of bromized collodion with fivo parts of iodized collodion.

"Positive collodion will require less bromide, as it usually contains somo already; but the exact proportion of iodide and bromide is not of much importance. Tho addition of bromide of cadmium to collodiou iodized with iodide of potassium, produces, by double decomposition, iodido of cadmium and bromido of potassium: the formor impairs the fluidity of the collodion, and the latter, being nearly insoluble in strong alcohol, is almost all precipitated. If, therefore, tho preseuce of iodide of potassium is shown by turbidity on the addition of bromide, it will be botter to dissolve about two parts of bromido of ammonium, and one part of bromide of cadmium in the smallest possible quantity of alcohol s.g. ·816, and to add this solution cautiously until turbidity is produced. The collodion will be found to be very little altered in fluidity and stability, and, when cleared by subsidence, to havo retaiued euough bromide to improve it greatly for this purpose.

"Should any doubt be entertained as to the good effect of so large a proportion of bromide as that recommended above, it may be easily removed by experiment. Prepare thirty-six drachms of iodized and eighteen drachms of bromized collodion in two bottles, the iodide and bromide being in the same proportion in both, and the same plain collodion being used in both cases. Coat and excite one plate or more with the iodized collodion; then mix half a drachm of bromized with four drachms of iodized collodion in a small bottle, and proceed as before; pour away into another bottle, and mix one drachm of bromized with four drachms of iodized collodion, and so on, increasing the proportion one-eighth part each time, until equal quantities have been used. We shall now have nine differently constituted sensitive layers, varying by one-eighth in each case, from all iodide to equal parts of iodide and bromide. The residues, if all poured into one bottle, will be found to do very well for ordinary use. The plates, after being prepared with tannin, are then to be exposed a minimum time in a uniform light, using the same subject, and developed in the same manner, when it will be found that there is a rapid and regular improvement up to three parts of bromide to eight of iodide, and that further addition of bromide makes but little difference up to equal parts of each. Three parts of bromide to five of iodide will probably give about the best result; and it will be seen that this proportion leaves an ample margin both ways, to allow for disturbing causes, such as a little bromide or an uncertain amount of iodide in the collodion, if of unknown composition. The different proportions of iodine and bromine in various iodides and bromides, and peculiarities in the quality of the pyroxyline, might slightly affect the quantity of bromide required to give the best result. The use of a large quantity of bromide has a tendency to diminish the opacity of the excited film. Should this effect be produced to too great an extent, a little more iodide and bromide may be added in the proper proportion to the collodion. Bromide may not produce so marked an effect if a trace of nitrate of silver be left in the film; but, even if the presence of nitrate with the tannin appears to answer the same purpose as bromide, the use of the latter and the entire removal of the nitrate is for many reasons a preferable mode of treatment.

"If the collodion be purposely prepared for use on gelatine with tannin, the following will be found to be a good formula:—

Iodide of ammonium	2 grains
Iodide of cadmium	1 "
Bromide of cadmium	2 "
Pyroxyline, prepared by Hardwich's formula for negatives by the wet process	6 "
Alcohol, sp. gr. ·805	4 drachms
Ether (the best which can be procured)	4 "

This collodion will require to be diluted with more alcohol and ether if used to coat large plates. The salts of cadmium give great stability to the collodion, and are very soluble in highly rectified alcohol; but they render the collodion so thick as to be ill-adapted for producing a good uniform film on a large plate. Iodide of ammonium has an opposite effect, rendering the collodion unstable, but very fluid; hence, by using different proportions of the iodides and bromides of cadmium and ammonium, we can vary the quality of the collodion in the above respects at will."

A bath sufficiently acid with acetic or citric acid to redden litmus paper is to be used. A first washing in distilled water, is followed by thorough washing in common water, in which it is recommended that the plate should soak not less than half an hour. A bath of salt and water may be used if desired, but the plate should then receive another washing, even more thorough than for the removal of the free nitrate of silver.

The strength of the solution of tannin, Major Russell here suggests, may be varied from ten to thirty grains to the ounce, varying with the kind of subject, the light and the kind of collodion; the stronger the tannin solution, the more rich and dense the negative. With subjects having much contrast and in a good light, a strong solution of tannin is apt to produce too much vigour. The plate is to be rinsed with distilled water, and the back of it wiped dry before applying the tannin. This is to prevent the slightest absorption of common water or other impurities into the preservative solution. Spontaneous drying at a moderate temperature is preferred to artificial heat. The following description of the appearance which should be presented by the plate, when prepared and dry, will be interesting and useful:—

"When the film is dry, the surface should present a bright and highly-polished appearance. If the collodion has been from good pyroxyline, any dulness seen by reflected light is always the result of some kind of mismanagement, and is most commonly produced in one of the following ways:—First, by adhesion of insoluble salts of silver, from the plates having been placed in hard water, or salt and water, before the nitrate was sufficiently removed by distilled water; secondly, by the film having been too much dried before immersion in the nitrate bath; and thirdly, from the use of over-iodized collodion. In the first case, the precipitated matter will appear in smears, following the direction in which the plate entered the hard water, or in which the water first flowed over it. In the second case, the deposit will probably be confined to the neighbourhood of the two edges which were upwards when the collodion was poured off, which edges will look blue and transparent. In the third case, the loose iodide will be distributed more uniformly over the plate, without the transparent edges at the upper end. In the first case, if the precipitated matter is of small amount, it may be entirely removed, and the plate made practically as good as if no deposit had been formed on it, by attaching the glass to the holder, and rubbing the surface with a tuft of clean dry cotton wool. This should have a handle formed by binding round a part of the wool with string, the end of which should form a loop, to hang on a nail in the edge of a shelf or other convenient place. If kept for this purpose only it may be used for a great length of time. In the second and third cases, the plate will be improved by removing the loose iodide in the same manner; and in the second case, the picture will be good on that portion of the film which retains its opacity, and is not rendered more transparent by the loss of iodide of silver. In the third case, a good result cannot be expected, especially when the amount of loose iodide is large, and has marked the film by bursting out irregularly.

"In all cases it will be well to brush the surface of the excited plate with the cotton wool before placing it in the slide, to remove any particles of dust which may be present. If a new and horny collodion was used, pretty hard rubbing will cause no injury, especially when the solution of tannin was somewhat concentrated."

The chapter on development is full of most valuable suggestions, by attention to which a complete power over the character of the negative may be obtained, even in cases of over or under exposure. A chapter on producing transparencies, for which tannin plates are pre-eminently suited, follows; and the book concludes with a chapter devoted to some remarks on dry processes generally, on which some excellent hints are offered.

The chief objection which has been urged against the tannin process is its slowness. This, however, can scarcely be regarded as a real objection. Unless instantaneous results can be obtained, or at least an approximation to the sensitiveness of the wet, the exact amount of exposure cannot be regarded as a matter of importance in landscape work. If an exposure of two minutes be necessary with one process, it cannot matter much that another process shall require three or four minutes. Instantaneous results have been obtained by means of the collodio-albumen process, and the aid of a hot developer; and it becomes a question whether heat may be applied in developing a tannin negative; we fear that it would be found unsuited to the character of the plates. For many purposes there can be no doubt, however, that the tannin process will always be found useful, and such a guide in its application as the manual before us, is most desirable. Much of the information, based as it is upon careful experiment and a thoroughly intelligent apprehension of the precautions necessary in the manipulations of the dry processes generally, cannot fail to be of the utmost value to all dry photographers, to whom we cordially commend the book.

Scientific Gossip.

It is necessary that those of our readers who practice their art in the City, should be warned of the danger they incur by using the water from some of the pumps, which were placed where they now stand when London was less crowded and the wells less contaminated than they are at present. Dr. Letheby, the analytical chemist to the Commissioners of Sewers, has lately given a fearful account of their impurities, compared with the New River water, with which the greater part of the City is otherwise supplied; the quality of these wells is most objectionable, for, instead of an average of only 19 grains of solid matter per gallon, the water contains from 20 to 127 grains. The quantity of organic matter in them ranges from 1·5 grains per gallon to 8·8; the common salt from 2·7 to 25; the alkaline nitrates from 2·1 to 24·6; and the combined ammonia from 0·5 to 2 grains per gallon. These results show that the City pumps are not only charged with decaying organic matter, but also with the saline products of its oxidation; the ammonia, for instance, is a sign of present putrefaction, and the alkaline nitrates of past; besides which the existence of so large a quantity of common salt is suggestive of the filthiest impurities, as, for example, the fluid matters discharged from the human body, and the percolations from cesspools and sewers. Most of these waters are bright and sparkling, and they have a cool and agreeable taste. They are, therefore, much sought after for drinking purposes; but the coolness of the beverage and the briskness of its appearance are dangerous fascinations, for they are both derived from organic decay. Dead and decomposing matters have accumulated in the soil, and have been partially changed by its wonderful power of oxidation, and thus converted into carbonic acid and nitre. These have given to the water the agreeable qualities which are so deceptive. In reality, the water from the City pumps is far worse than that from the muddy river from which it is in great part derived; indeed, it may at any moment become charged with the active agents of disease, for no one can say when the salutary influence of the soil may fail by being worn out or overtaxed, and then the putrid organic compounds will pass into the wells unchanged. Many of the pumps are in close proximity to the fat graveyards of the City, and it is more than probable that all of them derive a portion of their water from these sources, for they are the principal gathering grounds for the surface springs; in fact, they are the only open spaces through which the rain can percolate to reach the shallow wells. We need not dilate upon the great danger to health which is certain to arise from the habitual use of such water as this, as a beverage, even when it is mingled with some alcoholic liquid "to take the rawness off." City photographers are too sensible men to continue drinking such vile stuff after reading this account; but for fear any of them may think it good enough for photographic purposes, we take this opportunity of warning them against its employment in any form. The large amount of organic matter would fasten upon the silver and fix it on the surface of their paper in an insoluble form, where it would not cease to darken until the beauty of the print was irretrievably gone; the nitrates by their oxidising properties would be very dangerous compounds to leave in the pores of a delicate silver print when we know how very susceptible this is to vanish, the silver on the surface being almost in a position of unstable equilibrium, and liable to have its balance destroyed by the smallest atmospheric or aqueous impurity, when it eagerly takes the chance of fading away: whilst the ammoniacal compounds would not only have a similar effect to the above but would exert their own specifically injurious actions. Upon the whole we think that the less a photographer goes to a City pump the better: it would be far less injurious to make use of Thames water at London Bridge; this, after the suspended impurities were separated by a filter or by decantation, would not have anything like the injurious action of the water from any of these pumps. In order that the worst of them may be known and avoided, we append the names of some of the most impure. They stand in the order of their foulness as follows:—Bishopsgate Street Without, Aldgate pump, Cock and Hoop Yard, Houndsditch, Bishopsgate Street Within, Bride Lane, Bow Church Yard, Fenchurch Street, Little Britain, Basinghall Street, Chequer Yard, Dowgate Hill, Bell Yard, Gracechurch Street, Idol Lane, Ironmonger Lane, Bartholomew Lane, Cornhill, Bowling Square, White Lion Street, Half-moon Passage, Great St. Helen's, Gutter Lane, Honey Lane Market, Guildhall Buildings, and Glovers' Hall Court. Dr. Letheby promises us analyses of the remainder of the pumps; and if, as is most likely, they turn out to be equally foul, we will take care to lay the results before our readers.

A chemist, who, however, has not given his name, has recently published an account of a series of experiments which he has made on the preparation of gun cotton. The results he has arrived at may be summed up as follows:—The smaller the quantity of cotton wool operated upon, the more easy it is to prepare a good gun cotton. An ounce of cotton wool he found was as much as could be manipulated with safety. The proportions found to give the best results, were one ounce of cotton wool, 16 ounces of nitrate of potash, 12 ounces of English sulphuric acid (sp. gr. 1·84), and 12 ounces Nordhausen acid. Five minutes in this mixture was found to effect the change in the cotton perfectly. A longer exposure was not only useless, but mischievous. The temperature at which the action of the mixture goes on best is from 154° to 160° F.

A few more specimens of glass have been sent to our office to be examined in the spectroscope, we will describe them in the same manner as we adopted with the previous specimens described at pp. 349 and 373 of this volume.

13. (No. 1. B. K.)—A light orange yellow glass. This is of the same character as No. 12, but rather darker. Examined with the spectrum it was shown to entirely cut off the lavender and violet rays above the fixed line G; from F to G were likewise considerably diminished in intensity, but below F the rays were scarcely obstructed at all. In strong light considerable quantities of photographically acting light would get through the glass, and in weak light some would penetrate, so it cannot be recommended to continue the employment of this quality.

14. (No. 2. B. K.)—This is a very good kind of glass for ordinary employment in the dark room. It is of a deep orange brown colour, and except in very strong sunlight allows the passage of no chemically acting rays whatever. If the light, however, be very concentrated, traces of the green and blue rays are seen to struggle through, but these are in such small quantities that, if the window of the room be in a position that the direct light of the sun does not fall on it, and it be not more than a few square feet in size, no danger need be apprehended from its use. It would, however, be preferable to get a kind of glass such as that described at p. 373, No. 11.

15. J. L. M.—This is a very curious glass, being of a dark smoke colour. It scarcely seems to alter at all the colours of natural bodies observed through it. In the spectroscope the blue of the spectrum is nearly obliterated, but the indigo and violet are not acted upon so much. As far as the photographic value of this glass is concerned, it is positively worthless; the possessor might as well attempt to prepare his plates in the open air as to trust to this glass for protection.

16. X. Y. Z.—A deep bottle green glass, which in the instrument cuts off all the most refrangible end of the spectrum, leaving however a band of blue above the green. The other rays suffer little change; the green however appears to be intensified. This is not a good glass for the present practice of photography. In the olden times, when bromine was unused, it would have done, as it is opaque to all the iodic acting rays; but now, bromine is in such

vogue, it would admit plenty of injurious light about the line F.

17. H. Mac. D.—This specimen of glass is of a brown colour, similar in its appearance and action on the spectrum to No. 6, p. 349. As it lets all the green rays through, and a trace of the blue, it would be almost useless if bromine is employed in the collodion, whilst it would not be safe with iodized collodion, as in strong light some of the violet and indigo rays can get through.

ACCIDENTS WHICH OCCUR IN ENDEAVOURING TO OBTAIN MAXIMUM SENSIBILITY.

BY M. M. A. GAUDIN.

A strictly neutral silver bath causes a general fogging of the picture at the moment of development. It is absolutely necessary to acidulate the bath, but as little as possible, to obtain the maximum of sensibility.

Nitrate of silver fused and crystallized anew gives a suitable bath at once, but much of the crystallized nitrate sold is seldom pure. It is therefore necessary, when dissolved and saturated with iodide, to add to it a very minute quantity of carbonate of soda, and after filtration, to acidify it with two or three drops of nitric acid to the quart, and a still larger proportion of acetic acid is used.

Having resolved to acidulate only with nitric acid, to avoid the formation of acetate of silver, which is sometimes so objectionable, I was very much astonished to find this acetate of silver which prevented me from working a whole day.

Having prepared a new bath, first neutralizing it with carbonate of soda, and acidulating it with nitric acid, I poured it into my gutta-percha bath, without having first rinsed it out. I was greatly surprised upon examining the sensitized collodion film, to see it covered with a multitude of salient points, which remained after agitating the plate in the bath, and these points formed a multitude of holes in the picture which was riddled like a sieve. Upon examining the film under a powerful magnifier, I found that each white point was formed by a white crystal imbedded in the collodion film. I at first attributed this result to the collodion; but upon making use of an entirely different sample, I found the effect to be just the same. It must therefore arise in the bath, and upon examining the gutta-percha I found it covered with small microscopic crystals, which were easily detached from its sides by agitation, and became imbedded in the collodion film while it was still soft. Filtering the bath again diminished the number of these crystals greatly, but did not cause them to completely disappear. I then thought of acetate of lead which dissolves acetate of silver, and the addition of a small quantity of the salt of lead caused the crystals to disappear as if by magic. Their production was caused by a small quantity of the preceding bath acidulated with acetic acid being left in the gutta-percha, which had undergone decomposition upon the addition of the new bath free from acetic acid, and which doubtless possessed the property, like acetate of lead, of dissolving a small quantity of acetate of silver.

I have recently experienced an accident no less extraordinary than the above. After having tried a new bath with my little apparatus, I recognized in it an extraordinary degree of sensibility, the pictures obtained were of an unexceptionable purity, with skies of great intensity; while in operating with the same collodion, the same nitrate bath, and the same developing agent, the stereoscopic negatives were weak and fogged. The *fogging* was caused by parallel and circular striæ, which I could not attribute to negligent cleaning of the plates, as they had always been finished with great care in rubbing them *lengthwise*.

I should add that this difference between my little apparatus and my stereoscopic camera continued for six weeks constantly, so that at last I was disposed to believe that the camera of this apparatus possessed a malevolent influence, so far was I from suspecting the real cause.

Having previously made use, successsfully, of gutta-percha dishes, with the same apparatus, and the new dish I employed having through excess of precaution been covered with lac varnish, I had no uneasiness on that score; yet all my non-success was caused by that very dish.

Gutta-percha alone is a very bad material of which to make nitrate baths: it contains naturally much tannin, and nothing can be worse for silver baths than a reducing agent, however small in quantity. It is very well known to practised photographers that new dishes of this material are worthless at first; but there are some kinds which are altogether unfit for use. It was one of this kind that I had employed in the present case: its varnish seems to have disappeared. The bath maintained its clear condition, but the pictures never appeared without making me regret that I had ever employed it.

However, to decide the matter, I made a conclusive experiment, taking into account that the bath for my little apparatus, is a porcelain dish, while that for stereoscopic apparatus is a gutta-percha dish. With a new bath, slightly acidulated by nitric acid, my little apparatus gave me splendid proofs constantly; the first stereoscopic proof was passable, but with a feeble sky; the succeeding proofs were feebler and feebler, and fogged. I then changed the bath in my porcelain dish by putting into it that which was in the gutta-percha dish, and then the proofs taken in my little apparatus were also *fogged*.

By this decisive experiment, I at length recognized that the repeated failures, which I attributed first to the collodion, then to the cleaning of the plates, and then to the apparatus, were actually due to the gutta-percha dish. After that I decided that henceforth I should never employ gutta-percha dishes or baths to contain solutions of *nitrate of silver.—La Lumière.*

PHOTOGRAPHY ON MONT BLANC.

Last year, M. Bisson, whose photographs have earned him a well-merited reputation, attempted to scale the "giant of the mountains," with all the apparatus necessary for photographic operations. But the weather was so bad, that he had to abandon the attempt for a time, and this year he has resumed the undertaking.

On the morning of Monday the 22nd of July, he arrived at Chamounix, at the foot of Mont Blanc. The weather appearing favourable, the ascent was decided upon. The entire host of travellers which this beautiful summer has attracted to Chamounix, together with the honest inhabitants of this little village, who seem to live but six months out of the twelve, assembled to witness the departure of the intrepid photographer in company with his guide, Auguste Balmat—the worthy descendant of him who first placed his foot on the summit of Mont Blanc—and a company of five-and-twenty porters, who, in relays, were to carry "up yonder" the cameras, glass plates, collodion, and all the photographic paraphernalia. Then came the leave-taking, the shaking of hands, the oft-repeated cautions, counselling prudence, wishes of success, &c., and at the moment of starting a salute of cannon was fired. The echo flew from peak to peak, the sound becoming weaker and weaker, until lost in the distance, seeming to warn the travellers of the length of their journey, and to stimulate their courage.

At nine in the evening the party arrived at the *Grands Mulets*, the first station, beyond which M. Bisson was unable last year to proceed. At this point a Bengal light was burned as a signal, to which Chamounix responded by salvos of miniature artillery.

While seeking a few hours of repose, the travellers were soon awoke by the noise of the wind, blowing a perfect gale. Balmat, disconcerted at this *contretemps*, advised that their departure should be delayed. After the lapse of a couple of hours the violence of the wind abated, the weather cleared up, and it was resolved to proceed. Carefully holding each other by the hand, they, taking their lanthorns, resumed the ascent.

At six in the morning they reached the *Grand Plateau.* At this hour the weather was splendid. For a time M. Bisson entertained the idea of profiting by the serenity of the atmosphere to take some views of the strange and grand scenes by which he was surrounded; but the fear of losing so favourable an opportunity of arriving at the summit, from which they were still six hours journey distant, induced him quickly to resist the temptation, so pushing on, they soon arrived at the *Petits Mulets.*

But the courageous little party had scarcely arrived at this summit, when a fearful squall overtook them, that soon became a complete storm, which raised such a cloud of snow as soon to envelope the party in complete obscurity, and it was only with extreme difficulty that they succeeded in finding a shelter.

While sleep, which, as is well known, is mortal, in these elevated regions, soon overcame the whole party, M. Bisson requested Balmat, the guide, to pitch his tent on this spot. The guide, looking at him with unfeigned surprise, exclaimed, "Do you wish to see Chamounix ever again? we have only just time, and by God's help, to regain the *Grands Mulets,* the avalanches will soon be coming down, and the snow will not render this place safe very long."

Groping their way, for they could not see ten paces before them, the party endeavoured to retrace its steps, clinging to each other, and in this fashion they descended a slope of 45 degrees, some six hundred yards in length. Walking, or rather sliding, somewhat quicker than they desired or found agreeable, they soon reached the corridor, and then the *Grands Mulets.*

They were now at the same spot from whence they started in the morning.

The avalanches began to descend on all sides with terrific uproar. Calling the roll, every one of the party responded to his name; but two of the men were almost blind, and three others were not in a fit state to proceed. M. Bisson, and even Balmat himself were oppressed with severe headache. Nevertheless, they would not abandon their firm resolution, but determined to wait for fair weather, and fortunately, they had not to wait very long.

The wind abating, a consultation was held, whereupon it was determined to send the disabled back to Chamounix, and obtain a reinforcement of seven men. This required a long halt at the *Grands Mulets* for the rest of the party, longer than at any other portion of the journey. But about nine o'clock in the evening, voices were heard singing; it was the reinforcement from Chamounix approaching, which arrived full of mirth and courage. Their arrival was joyfully acknowledged. The evening was spent cheerfully, and the spirits of the whole party reanimated. At midnight the sky became clear, and illuminated by the rays of a full moon. The signal to advance was given, and the party proceeded to make the ascent.

At seven o'clock in the morning of the 24th they regained the *Petits Mulets;* at eight they attained the summit. The party was seen from Chamounix, for the echoes of their cannon were heard, even at that elevation.

But it was not yet time to shout victory! For M. Bisson had not yet fought his battle. His most difficult task had now to be commenced; to practise photography at an elevation of 16,000 feet above the level of the sea is certainly not child's play.

It was first necessary to erect a tent, beneath which, sheltered from light, the plates could be coated, the operator trembling neither from cold nor emotion, and then to sensitize them with steady hands in the nitrate bath. Now the disposition to sleep was invincible; every one was overcome by it. But as Balmat and M. Bisson, notwithstanding his delicate constitution, both resisted, they alone, unpacked the baggage, and arranged the apparatus. The tent was erected, the camera placed on its tripod, the plate coated, sensitized, exposed, and a view taken. What a view! what a panorama! It was now necessary to develop the picture, but there was no water at hand for washing the plates. They had reckoned upon the snow, and upon melting it with the heat from lamps; but in this rarified atmosphere they would only burn with the feeblest of flames. Amid his despair the baffled photographer was involuntarily reminded of the exclamation of the veteran of the Russian campaign, "The fire freezes." A man was placed at the lamps to keep them burning, he fell asleep. He was replaced by another, who did the same. At length M. Bisson himself succeeded in obtaining sufficient of the precious element. Hastening to his tent, at the door of which Balmat alone remained standing, he finished his negative. Now he might have shouted victory! But no. After a repose of two hours he recommenced operations, he would not go back without three pictures; he succeeded in obtaining them, two were good, one was passable.

The baggage was now repacked, the sleepers awoke after a good shaking, and the descent to the *Grands Mulets* commenced. They must hurry back to Chamounix, all but the photographer. At this point he must take fresh views, although impatiently expected in the valley below, where a grand fête awaited his return. The village was illuminated, fireworks exhibited, every body appeared over-joyed and happy, but none more so than M. Bisson.

ON THE PREPARATION OF "PHOTOGENE."

BY A. GAUDIN.*

I propose to give the name "photogene" to any sensitive compound containing iodide of silver with excess of free nitrate of silver. Gelatine can be mixed with nitrate of silver in any proportion, is the most convenient substance for the purpose.

To prepare this compound, dissolve in a flask, at a gentle heat, 1 drachm of white gelatine in 10 drachms of water. When it is all dissolved add half-a-drachm of nitrate of silver. Next, dissolve in another vessel 12 grains of nitrate of silver, and precipitate it as iodide by the addition of a soluble iodide. Collect the precipitate upon a filter,—wash it well, and then add it to the argentiferous solution of gelatine. The mixture must then be beaten up for some time until the liquid becomes homogeneous, and when spread upon glass resembles in appearance a sensitive film of iodized collodion. Before employing the photogene warm it, and filter it through a glass funnel, having in the neck a tuft of cotton wool, through which you have first filtered a little alcohol in order to remove greasy matter, and afterwards water to wash out the alcohol and damp it properly. The filtered opaline liquid is then used, while still warm, for coating the glass plates, which have been previously cleaned with a little albumen.

The photogene prepared in these proportions is extremely fluid, and flows over the glass plate as readily as collodion. Its great fluidity, favoured by its warmth, causes it to leave an infinitessimally thin film upon the plate, which is as structureless as the glass itself. When the glass has been coated it must be placed vertically to dry, with one corner upon blotting-paper. If you increase the proportions of gelatine and iodide of silver, you must use the photogene hotter, because it is necessary to produce as thin a film as possible. As soon as the photogene is cold, it becomes set, and the plate may be exposed in the camera, but you must not proceed to the development until the film is so dry as not to stick to the finger.

The image is developed by covering the glass with a concentrated solution of tannin, filtered. It comes out in general without silver, but it is better to add a few drops of nitrate of silver soon after applying the tannin.

By proceeding thus the picture exactly resembles one

* M. Gaudin's researches and discoveries in this direction appeared in *La Lumiere* about the same time that the announcement of Captain Dixon's patent, and also a letter on the same subject by Mr. Bellini, appeared in our columns. We were unable from the crowded state of our columns to publish it at the time; but as M. Gaudin is renewing his researches, and the subject is interesting, we now insert it.

taken upon albumenized glass. But the gelatine swells, and if the sensitive film is not extremely thin, its surface would become uneven, which would injure the details.

The image comes out at first red, and afterwards passes to an intense bistre tint. This photogene is nearly as slow as albumen. The image is also very long in developing.

The compound ought to be prepared and used in a yellow light, and the bottle which contains it should be screened from daylight. If light is allowed to act upon it, the photogene turns brown, and requires to be revivified. This can be done by adding to it a few drops of bromine water, which, after agitation, restores to it its clear yellow colour.

This photogene, spread upon a glass, and dried spontaneously, can be used in the same way as albumen, for printing glass transparencies.

In order to fix the picture with hyposulphite it must be used very weak—strength about five per cent.—for it tends still more than the tannin to render the film uneven. After an abundant washing, dry the plate by artificial heat, and varnish it in the usual way.

Photogene with Collodion.—I have prepared two photogenes with collodion, one with iodide, the other with chloride of silver as a basis.

The photogene with iodide of silver is sometimes as sensitive as a wet collodion plate. It may, therefore, be used for taking negatives upon paper, in the camera; or enlarged positive prints with a short exposure, and upon very large sheets.

The photogene with chloride of silver may be used as a substitute for ordinary positive paper for small pictures. Amateurs will find it very convenient for that purpose.

The photogenes with collodion exhibit different properties, according as they are applied to glass or paper. Upon glass the image develops very feebly and superficially. The photogene is almost impenetrable to developing agents; and this is unfortunate, because, but for that, it would realize the long-sought-for dry collodion. We shall arrive at that, no doubt, by imparting to it the porosity which it acquires when spread upon paper.

I prepare the collodion photogene by dissolving nitrate of silver in hot alcohol with a few drops of water, and adding this alcohol to common plain collodion. The mixture must be well shaken in order to incorporate the nitrate, which is only slightly soluble, with the collodion. While shaking the bottle add to it from time to time a few drops of common iodized collodion, which renders it more and more opaline. As soon as the mixture, when spread upon glass, exhibits the appearance of a homogenous film of excited iodized collodion, it is ready for use, provided the nitrate, of siver is in excess. To try this you must make an experiment upon paper thus:—

Spread upon a sheet of paper some of the photogene, exactly in the same way as upon glass. When the paper is dry lay a negative upon it, and holding it in the hand upon a support, expose it rapidly to diffused light. If the nitrate is in excess, an intense black can be quickly developed upon the paper with a little weak gallo-nitrate of silver; otherwise the compound is worthless, and you must continue shaking the bottle, and adding silver as before.

When the operation succeeds well the photogene is of exquisite sensitiveness. You must coat the paper with it in a yellow light, or at a long distance from a candle having a yellow screen, or you will not preserve the purity of the whites, for you are working here with a process which is much more rapid than chloride of silver printing.

On the day when I worked with a very sensitive iodized photogene, I obtained proofs in thirty seconds by the light of a candle, and in one minute behind the yellow glass of my laboratory window. And in order to print from a negative by diffused light, one second was a great deal too much, for the image came out instantly in very weak gallic acid.

The photogene adheres sufficiently well to paper to resist all the rubbings which it encounters among other sheets in a dish; but on rubbing a proof strongly with cotton wool it became weakened in that part, which makes me think that the adherence of the photogene to *sized* paper is hardly sufficient. It will be necessary, no doubt, to use unsized paper.

The collodion photogene with chloride is prepared in a similar way, only the collodion must contain chloride of ammonium.

On adding nitrate of silver to gelatine it is nearly sure to become opalescent, on account of the hydrochloric acid which it commonly contains; but that does not matter. If you use a chloride it must not be chloride of zinc, because that coagulates gelatine with great energy.

The collodion photogenes can be restored, when damaged by exposure to light, in the same way as the gelatine photogenes, viz., by adding a few drops of bromized ether or alcohol. In order to convince myself of this, I have made a direct experiment. After having blackened a photogene by exposure to sunshine in a plate, I restored the active yellow tint by adding a small quantity of bromine.

PHOTOGRAPHY WITHOUT LIGHT.

The name photography (light drawing) has been given to our art on the supposition that it is by the presence and action of light that our pictures are made. The name has proved a very good name, no objection has been made to it, it answers to the notions of most people. Yet in a scientific point of view it implies a falsehood, it is almost a *lux a non lucendo.*

Scientific research has demonstrated that the light which renders objects visible and the light for which our eyes are made is not the force or even a part of it which so wonderfully fixes the forms of things on our chemicals. Our mysterious friend is far more subtle and more spiritual—we scarcly know her by name, and are only able to recognise her in the work she performs. We have eyes for light, and ears for sound, but what sense informs us when *actinism* is present?

Photographers are able to know from their own experience that actinism and light are not the same thing. The yellow paper or glass of the dark room lets in the light but stops the actinism in transitu. Perhaps if we had a sense which could observe the actinism on the glass or paper we should find it all on the outside, like dirt on a filter.

Place a yellow glass before the camera tube, and you can get no picture, but not because there is not light enough. Or, instead, use a deep blue glass, and you may have a picture, although no visible light got through to the plate. If the sun should suddenly stop shining, but emit only actinism, although we should be in pitchy darkness, we might still produce all the chemical effects of photography.

Now I think it quite useful that these facts are so, for it gives us the opportunity of using our eyes, where otherwise we could not. If our chemical preparations were ten times more sensitive than they now are, and actinism could not be separated from light, we would not dare to have even the glimmer of a candle about our developing. But as nature has ordered these things we may have chemicals a hundred times more sensitive, and yet have a brilliant light of day over all our work.

Thus far we have made little use of these facts further than to let light into the dark-room through a yellow screen. But why not go further? I offer a few hints:—

If the cap of the camera tube and the back of the shield be a pure yellow glass, the focus may be taken on the sensitive film itself. Or rather let the whole plate shield be of yellow glass, or even the camera box and all.

Let the camera box be made of yellow glass, enclosing the bath and developer, so that the entire photographic process may be carried on in open sunlight!—*American Journal of Photography.*

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 21*st August*, 1861.

M. Gaudin in seeking to establish a comparison between his *Photogene* and the tannin process of preserving dry collodion plates, finds that when a wet collodioned plate required, under the best possible conditions, an exposure of six seconds, his photogen, which had been on the glass plate for three quarters of an hour, after an exposure of thirty seconds gave a weak negative, indicating that the exposure should have lasted sixty seconds, and thus showing that his photogene is at present ten times slower than wet collodion; but supposing he had a light four times stronger, a plate prepared by the tannin process requiring an exposure of nine minutes, is twenty times slower than wet collodion, and twice as slow as a half-dried photogene film; and he thinks, that in all probability, dry photogene would have proved as rapid as a dry tannin plate.

It remains to be ascertained whether the photogene will keep long in a dry state, and retain its sensitiveness. A preparation with which it suffices to coat a glass plate, which may be exposed immediately or in the course of an hour, without requiring to be immersed in a nitrate bath, appears a considerable step in advance; but means must be found of giving to this photogene a high degree of sensibility, and of employing it in the dry state like other collodions.

The problem M. Gaudin is engaged in solving is of so much importance to photographers, that his progress to its successful solution will be watched with much curiosity and interest.

The spontaneous decomposition of gun-cotton, a question of much interest to photographers, has recently been the subject of careful research on the part of M. de Luca. He obtained some gun-cotton in Paris in 1859, enclosed it in a bottle which was kept sheltered from the action of light, in a cupboard in the chemical laboratory of the Faculty of Sciences, Pisa. Its spontaneous decomposition took place during the summer of 1860, with the disengagement of nitrous fumes which attacked and corroded the cork of the bottle. The product of decomposition had a white aspect, slightly yellow on the outside, was pasty and glutinous: it formed an emulsion with cold distilled water: this emulsion passed slowly through the filter; filtered, it was limpid, and reddened litmus paper; in contact with copper and sulphuric acid, it gave off nitrous fumes; and was coloured deep yellow by potash or ammonia; it reduced the tartrate of copper and potash; in contact with an aqueous solution of iodine, it did not become coloured; when heated with sulphuric acid, it became of a deep brown colour; it gave a precipitate with excess of lime, and was also precipitated by chloride of silver, in presence of a small quantity of ammonia; when mixed with eight times its volume of alcohol, it gave a flocculent precipitate. The decomposed gun-cotton kept under a glass receiver at the ordinary temperature, in presence of concentrated sulphuric acid, became perfectly white, could be reduced to powder between the fingers, and lost about 38 per cent. of its weight. The flocculent substance precipitated by alcohol, collected upon a filter, washed with alcohol, dried in presence of concentrated sulphuric acid, is amorphous, almost opaque, friable, and of a gummy appearance, and dissolves readily in cold water; this solution is precipitated by acetate of lead, and reduced by tartrate of copper and potash. The modified aqueous solution of cotton, evaporated on a *bain marée*, deposits a substance which becomes spongy, light, white, friable internally, adherent to the fingers externally; which is soluble neither in ether, nor in a mixture of ether and alcohol, and only partially in alcohol; when this alcoholic solution is evaporated a residue is obtained, which reduces easily and abundantly tartrate of copper and potash. The portion insoluble in alcohol, left in contact with moist air, assumes the aspect of an extremely dense solution of gum; the modified cotton is attacked by warm nitric acid, with the disengagement of nitrous fumes, and the production of a yellowish substance soluble in water, and precipitable by acetate of lead, nitrate of silver, and nitrate of mercury.

The remarkably fine season we have been favoured with has attracted large crowds of visitors to Mont Blanc, among others, the distinguished photographer M. Bisson, who has fortunately succeeded in taking some views from a point near the summit of the mountain. Proofs of these negatives will doubtless be obtainable before long, and will assuredly excite the greatest interest in the photographic world.

SUNDAY PHOTOGRAPHY.

Sir,—I was much pained and surprised on reading in your excellent journal of the 16th inst., under the heading of "The Photographic Nuisance," the following paragraph:—

"We are the sworn foes of intolerance, and utterly deny the right of the law to interfere in questions of conscience." Nothing can, in my opinion, be clearer than the Fourth Commandment; and it is impossible to say that we are not bound to observe it without invalidating the other nine. If it be, as you say, a mere matter of conscience, so is drunkenness; and I think you will scarcely be bold enough to assert, that because a man tells you he sees no harm in getting intoxicated, he should not be fined for the offence. My own opinion is, that it is a disgrace to our legislature that not only the keepers of Photographic Dens, but of Gin Palaces, Tobacconists, *et id genus*, and more, should with impunity be allowed to desecrate the Sabbath. The declaration of our Saviour, that the Sabbath was made for man, cannot by possibility be made to extend beyond works of necessity; and if men have *no consciences* of their own, there can be no valid reason why they should not be legally prevented from outraging the feelings of those who have.—I am, sir, your most obedient servant, B. Jones.

[Polemical questions are not suitable subjects for discussion in our columns, but we willingly insert anything calculated to repress the practice of Sunday Photography. We must re-assert, however, our conviction that the law has no right to interfere in questions of conscience; and that in regard to drunkenues, the case quoted, the law has no right to interfere except so far as it trespasses on the comfort of the community, and becomes, as the enactment phrases it, "drunk and *disorderly*." And it is just in such a case where Sunday Photography becomes a public nuisance, that we conceive the law has a right to interfere. We should wish to see and aid a public expression of opinion from all respectable photographers, on such a subject. Still, a breach of the Fourth Commandment until it becomes an overt act, does not, we conceive, come under the consideration of any human law.—Ed.]

Proceedings of Societies.

Brook Green Photographic Society.

Inauguration Meeting, August 1, 1861. Professor Muddle, in the chair.

The Chairman, after stating the objects of the Society, introduced Mr. Fuddle, who read a most interesting and elaborate paper upon "A process of obtaining instantaneous photographs without any apparatus or chemicals whatever." The very title of the paper promised an exciting evening. We can only give a brief abstract in our present impression owing to the crowded state of our columns.

The learned gentleman explained that although he certainly considered he had a right to claim the originality of the process as applied to photography, the first idea was suggested to him by a well-known fact that had, he believed, been rather widely circulated of late by the press. The fact he referred to was that "by merely pouring boiling water into Fusbos' Kaffogen, from one cup to a hundred gallons of delicious coffee may be instantaneously produced." It would be clear to any one acquainted with the subject that a precisely analogous process might be employed to produce any number of delicious photographs, by merely substituting, *in the proper manner*, for the boiling water, or agent for transmutation, a ray of light, and for the kaffogen, or receptacle, a glass plate. This was what he (Mr. Fuddle) was happy to say he had been able to effect to his entire satisfaction. The paper then entered largely into the valuble results that must inevitably arise from such a process, the details of which were not explained, and the learned author sat down amidst great applause.

Mr. Blacksheep regretted that the time of the meeting should be wasted in discussing a paper which he could only compare to the "Comedy of Errors." The whole theory was wrong, the deductions false, and the asserted results impossible. He would have considered such rubbish unworthy of his notice, but that he owed it to himself to refute the assertion that Mr. Fuddle was the discover of the process. It was known to all present that the invention was the result of his (Mr. B.'s) labours, and indeed for some years past he had constantly used it with perfect success.

Mr. Twaddle entirely disagreed with the last speaker. He considered the paper a very valuable one, practical and sound. He was affirmed in this opinion by the abuse bestowed upon it by Mr. Blacksheep.

Mr. Mumble complained that he had been long unsuccessfully trying to catch the chairman's eye.

The Chairman said it was no fault of his. His eye was always at the disposal of the meeting, but he could not be responsible for the maladdress of individual members who were unable to catch it.

Mr. Mumble replied that the Chairman's urbanity was too well known for it to be supposed he meant to fix any blame on him. The fault lay in the incomplete lighting of the room. He thought that the illuminating powers of gas had now been sufficiently established to justify the council in sanctioning its introduction, as soon as the funds of the society would permit.

Mr. Blacksheep was surprised such a suggestion should be made. The pernicious effects of gas on works of art were well known. It would be pitiable if the art treasures with which their walls might be covered should be destroyed by careless inattention to such matters. He had written a book on the subject.

The Secretary reminded the last speaker that at present the walls were only covered with whitewash, upon which gas was not known to have any destructive action, and the terms of their lease secured them the right to have it restored annually at the cost of the landlord.

After a few words from other members,

Mr. Fuddle remarked, that although the meeting appeared to be adverse to the introduction of gas, he was sure that, as photographers, they would not object to a better light; he therefore moved "that the secretary do snuff the candle."

The motion having been seconded and put from the chair was carried; when

The Secretary said that agreeably with the wishes of the meeting he had entered the motion in the minute book, but he, must respectfully decline to comply with its provisions. There were no snuffers.

Mr. Blacksheep felt indignant that the funds of the society should have been squandered, he knew not how, and that articles of the first necessity were still unprovided. However, as this was the case, it appeared to him that the council neglecting their duty did not justify the Secretary in neglecting his. The meeting had formally passed a motion embodying an instruction to him. It was his duty to obey those instructions whether he had the means afforded him of doing so or not. That was his notion.

Corporal Trim observed that as it appeared a question of discipline, he might be allowed to say a few words. Formerly, when England was in danger, he had been a militia-man. Many present had seen him on the Green. He was now a volunteer. When officers gave an order, that order must be obeyed. He was quite sure that was the rule of the service.

The Secretary remarked he was an officer of the society which was giving orders to him.

Corporal Trim was aware of this fact, which, of course, altered the matter entirely.

The Chairman said he was not a military man; but he was going to volunteer—(cheers). The meeting should not interrupt—he was going to volunteer a proposal by which he believed the wishes of the meeting might be met notwithstanding the difficulties which had arisen.

Mr. Blacksheep objected to any compromise. The Secretary must snuff the candle; any other course would stultify the meeting.

Mr. Fuddle, as originator of the motion, begged to remark that the excuse of the Secretary was frivolous. The means or instrument to be used was not mentioned at all, as might be seen on referring to the minutes. The absence of snuffers, therefore, had nothing to do with the question.

The Secretary was not going to burn his fingers to please the gentleman who had just sat down.

The Chairman complained he had been interrupted. The last observation of the Secretary brought him at once to the proposition he was about to make just now. The last time he went to the play he had the misfortune to burst his gloves, a misfortune he now rejoiced in, for having that evening put on the same coat, he had them in his pocket, and he was thus enabled to offer the Secretary the use of the right hand one to protect his forefinger and thumb in the operation, which, he would no longer object to perform with such a guarantee.

The Secretary said that after the very handsome and liberal proposition of the Chairman he should not feel justified in any longer refusing compliance with the terms of the motion. He, however, noticed that the hole in the glove confided to him by the Chairman was only the stitching unsewed, and it could easily be mended. Under these circumstances he begged to state he had a pair of nail scissors in his pocket, and he would have the greatest pleasure in devoting them for this evening to furthering the interests of their society. (The Secretary accordingly immediately produced the instrument alluded to, and cleverly snuffed the candle.)

After a few complimentary remarks from several of the members, a vote of thanks was passed to Mr. Fuddle for his most valuable paper, the discussion on which was postponed to another evening.

Mr. Jones (of the firm of Brown, Jones, and Robinson) exhibited a card intended as a mount for stereographs.

Mr. Twaddle said he had ascertained by very careful measurement that the dimensions of the mount were precisely as stated upon the card.

After the customary vote of thanks to the Chairman, the meeting was formally adjourned.

Photographic Notes and Queries.

Blisters in Sensitizing Albumenized Paper.

Mr. Editor,—The troubles of a photographer are numberless, I am again obliged to call on Hercules to help my team forward. The present case is this, I sometime since purchased a quire of albumenized paper, warranted to be the *best:* how bad some might be I do not know; but I find each that I have used like the piece enclosed; when drying after sensitizing, it blisters as if it had the small pox, and on printing, the top of many of the blisters becomes stained as if the pimple had broken, and a virulent pus had exuded. Can you oblige me by telling me the cause? I applied to the party of whom I purchased the paper, sending specimen; and the reply was, that I had spilt some hypo over it, and used too much alkaline in toning: now the blisters and spots appear before being toned at all, and no hypo has had a chance of coming near it. This puts me in mind of the description of a crab given by a learned society as being a fish of a red colour and walking backwards; which was submitted to a famous naturalist, who said it was very exact except that the crab was not a fish, was not of a red colour, and did not walk backwards. I certainly feel vexed after paying a fair price, that I cannot use the article: it may in some way be my own fault, but I cannot imagine how that can be. Please to let me have your opinion on it, and you will greatly oblige. Will you also please to tell me how I can best contrive to dry several pieces of sensitized paper at once, without risk of the wet corner curling up and making a stain wherever it may touch the other part of the sheet. It takes so much time to sensitize and dry one piece at a time.—I am, dear sir, yours very truly, T. P. E.

[This difficulty is a new one to us and we publish the letter in order to learn, if possible, whether any of our readers have met with it. We are very familiar with blisters, which sometimes occur in the toning bath, but more frequently in the hypo, and which generally subside on drying. These it appears occur at an earlier stage and cause a stain of a bluish black or grey colour in the print which is forwarded for inspection. Is the silver bath highly alkaline, or acid? As to the curling up on drying all albumenized paper will do that; but if properly hung there should be no chance of stains. Suspend each piece by one corner, and attach to the other corner, where the drop collects, a piece of blotting paper. The paper will curl as it dries, but there can be no contact with any part wet with the silver solution. If you suspend by *two* corners this may happen.—Ed.]

Talk in the Studio.

Panoramic Photography.—The panoramic lens in the hands of Mr. Ross has been turned out a complete success. We have just received from Mr. Sutton an exquisite specimen consisting of a view of St. Brelade's Church and adjacent scenery, including an angle of upwards of 90° on the horizontal line, and 55° vertically. The picture is about 9 inches long, by 4½ deep, and is produced by a lens of only 5¼ inches focal length. The definition is throughout very fine, and is pictorially sufficient through every gradation, from the foreground to extreme distance. With the amount of subject included there is a fine picture, which would be comparatively worthless if it only contained one-third, or a little more, the amount usually given with a common view lens. The negative, which was taken on a tannin plate, is manifestly a very perfect one, soft, and vigorous, and giving a nicely tinted atmospheric sky. For a large class of subjects there can be no doubt the panoramic lens will be invaluable in its range of pictorial effect. We understand Mr. Ross has purchased the patent of the lens, and is now engaged in producing apparatus for stereoscopic sizes, and one to produce pictures about 30in. long, as well as intermediate sizes.

Instantaneous Photographs.—We have recently seen some very fine instantaneous pictures of Scottish scenery by Mr. Wilson of Aberdeen, which he had forwarded to Mr. Dallmeyer as specimens produced by the 6 in. by 5 in. triple achromatic lens. Amongst these were some fine views of Her Majesty's residence at Balmoral, mountain scenery, water-falls, sea pieces with shipping, &c. In one or two cases there were traces of slight under-exposure; but the wide angle, the exquisite definition, the well-chosen points of view, and above all, the exquisite natural clouds render these pictures perfect gems. The charm which a photograph receives from a tint in the sky, and a few delicate natural clouds, is most unspeakable, and worth any cost of effort or appliance to secure.

Photographic Identification.—The *Times*, relating the capture of a fraudulent bankrupt, named Ladislaus Kiss, by Haydon the detective officer, illustrates one of the uses of photography. The bankrupt has absconded with £40,000; he was traced through various parts of Italy by the officer, and finally ascertained to be in Turin. The officer did not know Kiss personally, but was possessed of the unerring guide, a photograph, from careful consultation of which he had become familiar with the man he wanted. The *Times* says "in a day or two Haydon met a well-dressed man walking in one of the principal streets. The practical utility of employing photography to assist the ends of justice was now proved in a most convincing manner. The photograph established the fact that the man coming down the street in a quiet unsuspecting manner was Kiss himself." Haydon left him a prisoner in the hands of the Venetian police.

Royal Photographs.—Mr. Lacy, of Ryde, Isle of Wight, was recently summoned by Her Majesty to Osborne, for the purpose of producing portraits of the Crown Prince and Princess of Prussia, the Princess Beatrice, the Prince William of Prussia, and the Princess Charlotte of Prussia, together with the various ladies and gentlemen of the suite, amongst whom were the Baroness von Dobeneck, Baroness Brühl, Count Furstenstein, the Countess of Desart, and the Honourable Victoria Stuart Wortley, Maid of Honour to the Queen.

Book Postage to France.—By a recent arrangement the advantages of the book post are established between this country and France. Photographs, patterns, commercial and legal documents, printed, engraved, or lithographed works bearing corrections or manual notes, manuscripts &c., provided there be nothing in the shape of a letter, may be conveyed under these provisions. Prepayment will be necessary.

Photography for Reproduction.—The *Athenæum*, referring to some of the pictures at Hampton Court, remarks:—"The cartoons of the Triumphs of Julius Cæsar, by Andrea Mantegna, have been protected by large sheets of glass, and are now seen to much greater advantage. The large chalk drawing, or cartoon, copied by Casanova from Raphael's Transfiguration, is in a miserably dark room, although one of the best and most valuable transcripts of the original picture, and of the same size. It certainly merits a more prominent position, and would, from the dulness of the surface, and clearness of execution, be a very good subject for photography. Copies multiplied by this process would render more service to students than any lithographs or line engravings now current; and we hope the authorities will take our second suggestion into consideration.

To Correspondents.

F. J.—We are glad you found the suggestion cure the evil. Your present difficulty will require a little experience in printing to enable you to avoid it always. All prints lose a little of the black tone on being placed in the hypo, but some papers more than others. Each different sample of paper may require different degrees of over printing in order to secure the right depth in the finished picture. To ascertain, examine the picture whilst toning, by transmitted instead of reflected light. If on looking through the print it looks brown, no matter how black on the surface, it will become brown in the hypo. Tone until you get a purple tint on looking through the picture. Test paper will show whether the hypo be acid or not; to prevent it becoming acid keep a piece of chalk in it.

James Thomas.—The use of the term grains in reference to fluids is rather a loose mode of expression, but cannot mislead us as it indicates the proportion. The exact strength of the ammonia or hypo solution to be applied after bichloride of mercury for darkening the deposit is not very important, but it should be extremely weak in order that its action may be under control. Either hypo or ammonia have a similar effect, producing brown or black, according to the strength of the solution and the time they are allowed to act. They are preferable to hydrosulphate of ammonia, as being quite as efficient and less offensive to use.

E. C. M. L.—We have heard the positive collodion of the first-mentioned form well spoken of. If your half gallon of collodion be not iodized, being a year and a half old, will not unfit it for being rendered sensitive by iodizing. If it have been iodized that time, and with a simple iodide, it has probably lost much of its sensitiveness; try the addition of a bromide to it. 2. The size of the camera should be proportioned to the power of the lens, and will make no difference in the rapidity. 3. In taking pictures with the film turn from the lens in order to produce non-reversed portraits, the ground glass should be adjusted to give a correct focus for the plate in that position. 4. In copying pictures the same size, or a little less, there is no necessity to reverse the lens. Either of the lenses named will serve for copying, but we cannot tell you which would be best without examining them.

Very Troublesome.—The only certain method of ascertaining the specific gravity of liquids is by means of the hydrometer or specific gravity bottle. The oil of vitriol of commerce is generally sufficiently strong for use in the manufacture of pyroxyline, and a trial, observing the conditions we have recently laid down, will best decide any modification in the proportions.

M. A. is thanked: his communication shall receive attention.

F. L. B.—You may use your silver bath weaker, and print the negative in strong sun-light. You will probably by this means succeed in getting a softer print. Your tones are too cold and inky.

H. J.—The term "Depth of Definition" was first suggested by ourselves in an article on "Depth of Focus," to meet the difficulty in applying the term depth to that which could not possibly possess depth. The perfection of focus could only exist in a mathematical plane, whilst sufficient definition ought to exist in every plane, and its use involves no contradiction of terms. We subsequently suggested the term to the gentleman referred to, who immediately perceived its suitability.

A Novice.—An ordinary quarter plate lens can scarcely be hoped to cover a standing figure for *carte de visite* portraits properly. Either a good half plate lens, or one made for the purpose, should be used. Regarding the question of selecting, we cannot advise you in these columns, but will write to you.

L. P.—Rolling improves prints very greatly, and by pressing the fibre of the paper firmly together, seem to give improved definition. Card portraits should never be sent out unrolled.

H.—We have mentioned the subject spoken of in your letter to Mr. Crookes, the editor of the *Chemical News*, who, we believe, undertakes professional analyses. He will communicate with you on the subject. In such a case as this, where important commercial interests are at stake, it is best to get a professional opinion at once, and not trust to an amateur analyses.

T. S. Swatridge, Yeovil, would esteem it a favour if any gentleman would kindly forward him per post, the address of Oscar Lawson, Artist Photographer.

R. A. C. asks, "Is it your opinion that when a collodion at 2d. per oz. which produces a moderately good portrait is mixed with a collodion at 6d. per ounce, which produces a good portrait, that the mixture will produce a *better* portrait than *either*." We must confess that we are a little puzzled with the idea of a collodion retailed at 2d. per ounce giving portraits at all. The mixture of two collodions often produces a better result than could be obtained from either alone; but that depends on their possessing opposite qualities, the one too soft and the other too intense, and would not be at all regulated by their respective prices.

A Continental Subscriber.—We do not remember at the present moment such a person as you describe. Your best plan will be to insert an advertisement in our columns, stating such particulars as you have given to us, and add the amount of capital which would be required.

W. W.—The old hypo bath is now abandoned by most good photographers. Some few still use it, and their prints may generally be detected by their yellow tint. By all means use the alkaline method. There is no harm in your trying the whole of them. The acetate of soda is producing good results in many hands.

James.—It is an excellent plan to have two samples of collodion, one very intense, and simply iodized: and another containing a bromide, and giving very soft pictures. You can then by mixing the two in different proportions from time to time, produce any result you may desire.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

⁂ Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 156.—*August* 30, 1861.

IRON NEGATIVES AND BRILLIANT PRINTS.

The use of salts of iron for development has within the last few years become very common, and among portraitists is now all but universal. Contemporaneously with the use of iron for development, the addition of a bromide to negative collodion has also become common. The advantages of an iron developer, and bromo-iodized collodion in giving clean and soft detailed negatives, with a short exposure, as compared with the hard, chalky, dense negatives so common under the pyro règime, have been unhesitatingly recognised. It is true that when the pyroxyline is just of the right quality, the ether very pure, the alcohol just in the right proportion, the collodion just iodized sufficiently long, and the bath in precisely the right condition, when all these conditions are combined, most exquisite negatives may be obtained with simply iodized collodion and pyrogallic acid development; but the delicate balance necessary is perpetually altering. The collodion that is perfect to-day is changed to-morrow, and still more so the next day, so that the amount of exposure under similar conditions of light must be perpetually varied. When the collodion is too newly iodized, it is sensitive but spotty, and it is very difficult to get clean pictures; when it has been long iodized it is insensitive, and it is next to impossible to get soft pictures. With the bromo-iodized collodion an average degree of sensitiveness may be maintained for months without sensible alteration, whilst clean pictures may be obtained within a few hours after iodizing. With iron development perfectly detailed pictures may be obtained with half the exposure necessary with pyrogallic acid, except when all the conditions suitable for the latter are present. It is not surprizing then that amongst portraitists generally, and amongst landscape photographers where extreme rapidity is necessary, the use of iron development and a bromo-iodized collodion should have come into extensive use.

But it rarely happens that an advantage is gained in one direction but at the cost of some evil in another direction. A new class of difficulties have sprung up as the attendant sprites of bromine and iron. Rapidity has been gained, cleanness has been secured, and the pictures are more generally soft. But they are often feeble and poor; they lack vigour and brilliancy, and they are especially difficult to manage under the alkaline gold toning system. The tendency of bromine is to give a thin grey superficial image without any density or opacity in the deposit, with veiling of the shadows. The tendency of iron development is just in the same direction. The consequence is, that unless some care be exercised, a thin grey veiled image is obtained, difficult to intensify, and not sufficiently repellant of light, however much it may be intensified. The consequence is, that meagre flat prints, without either rich blacks or pure whites, are not uncommon.

To avoid these evils, and succeed in producing brilliant as well as soft prints, where iron development is used, it is important to possess, in the first place, a correct idea of the kind of negative desirable, and in the next place a knowledge of the precautions necessary in producing it.

As regards the negative it is not necessary that it should be very intense, but it must be brilliant. With pyrogallic acid development a negative may be obtained, which by reflected light is quite invisible, the film presenting one universal drab surface. The same negative may, however, by transmitted light, may present a picture perfect in gradation, which in printing gives the most satisfactory results. With iron development such a negative would give a flat poor picture without relief, richness, or vigour. The intensity of the lights would not have increased in the same ratio as the deposit in the shadows, so that in printing the whites would begin to print through before the shadows had obtained sufficient depth. With pyrogallic acid development a negative which presents anything of a positive character, showing a well defined image by reflected light, especially if in places there be bare glass, will generally give a hard picture, with chalky lights. With iron development a negative may with propriety give some indication of the character of the image by reflected light; it must have no deposit on the deepest shadows, and may present in a few points merely bare glass.

An iron negative may be thin, delicate, and soft, and yet give brilliant prints, *but it must possess its proper scale of tones or gradations.* This is really the point of importance. To illustrate what we mean. Suppose a picture to possess twenty gradations of tone: to be perfectly produced in photography, the negative must consist of twenty gradations of thickness or opacity of deposit. A negative which commences with bare glass or entire transparency, allowing the uninterrupted passage of light for producing its deepest tones, and contains the various gradations up to twenty may not appear very dense even in its highest light, and may yet give a perfect and brilliant print. A negative, with a deposit over the deepest shadows, of an opacity equivalent to ten gradations, must possess in its highest light a deposit equivalent to thirty gradations of thickness or opacity, in order to give a good print; and if it only reach twenty-five gradations of deposit in its most opaque part, although it may appear to the eye considerably more dense than the first-named negative of twenty gradations, it will nevertheless yield much less brilliant prints: prints in fact whose scale of tones will back just five gradations, and which look meagre, poor, and comparatively worthless.

Let it be remembered then, as an axiom, that a good iron negative is generally a thin one, and that it must commence with bare glass for its lowest scale of tones; but that, as in a good picture the lowest scale of tones, or black, is very sparingly used, a good negative will present some, but very little bare glass, or points without any deposit whatever.

Having then a distinct conception of the result to be produced we proceed to consider the means necessary to this result. These consist in the preservation of proper conditions in the collodion, the silver bath, and the developer, and we shall consider them in this order.

Regarding the collodion a very common mistake prevails. Many photographers have an impression that to produce a negative by iron development a positive collodion is necessary, and they speak of the result as a "converted positive," or a "negative by the positive process." The negatives produced under such an impression are generally of such a character as to serve as a beacon and warning to all who have not yet tried the process. In the long-continued attempt to get vigour by a subsequent intensifying process, the shadows are veiled, and the half-tones are buried and destroyed by a coarse granular deposit. The prints are poor flat affairs, possessing neither pure whites, deep blacks, nor delicate half-tones.

A collodion suitable for iron negatives should give decidedly more intensity than is usually desirable for positives, or a tame flat picture which intensifies imperfectly will be the result. It should be made with pyroxyline obtained at a high temperature, somewhat organic in character, and dissolving freely at least six grains to the ounce of solvents without being at all thick or gelatinous. Sufficient pyroxyline is one important element in the production of a dense creamy film in the nitrate bath, and subsequent intensity in the negative. Such a collodion, when simply iodized, would in a very short time give hard, chalky pictures, but the addition of a bromide preserves sensitiveness and gives softness. The amount of bromide should be proportioned to the character of the pyroxyline. A pyroxyline, having a tendency to give great density, will easily bear half-a-grain, or sometimes more, of bromide to the ounce; but in many cases, for negative portrait collodion, one-third of a grain will be found to confer softness and cleanness, and preserve sensitiveness, without impairing intensity. The iodizers we have found best for the purpose have generally been a mixture of iodide of cadmium and the iodide of some alkaline base, either potassium. ammonium, or sodium. But whilst cadmium confers stability, it should by no means be used alone, for two important reasons: it is apt to confer glutinosity upon the collodion if it contain as much pyroxyline as we have recommended; and for some length of time after it is iodized, there is often a slight tendency to that foggy deposit in the shadows which is so fatal to the value of thin negatives.

To those who do not make their own collodion we would recommend a very simple expedient for generally possessing a stock in the desirable condition, Procure a stock from some maker well known to prepare a very dense collodion of the character so much in request some years ago. There are two or three makers known to prepare such a collodion. Sensitive and soft whilst newly iodized, but spotty; becoming in a few days very red, and giving chalky, intense lights, and masses of transparent glass for shadow. Have also a stock of positive collodion, giving a thin, clean, soft, detailed image. Mix these in various proproportions until the right one is found for giving clean, soft image with sufficient density; an intense, brilliant image with sufficient detail. As, from time to time the condition of the bath, the quality of the light, or the temperature changes, the proportions may be varied in order to get a little more sensitiveness, softness, or density, as the case may require. By adopting this plan almost any class of result may be had at will with very little trouble.

It sometimes happens that the collodion is working in some respects well. The right amount of intensity is present, and it is combined with sufficient detail. But is associated with a slight tendency to reduction of the shadows. This will most frequently happen when the collodion is new and newly iodized, especially if a large proportion of cadmium is present. The addition of an old coloured collodion will frequently remove this tendency; but if this cannot be conveniently done, or if the tendency to deposit be not removed without adding a proportion which would interfere with sensitiveness; then the addition of a few drops of tincture of iodine will frequently be found to answer the purpose; the amount should be proportioned to the state of the case, enough to make the collodion the colour of pale sherry will generally be sufficient. The addition of free iodine to collodion for positives, with a view to preserve clean shadows, is a practice of well-known value. In collodion for negatives its presence has generally been considered inimical to sensitiveness; but this will be found to be the case chiefly with pyrogallic acid development. Where iron is used, ond other things are in harmonious condition, its presence, in moderate proportions, will not be found to affect sensitiveness in any sensible degree. The use of about one drop of hydrobromic acid to an ounce of collodion, which is occasionally recommended in the positive process for the same purpose as free iodine, will be found to have a similar effect in iron negatives, without any advantage, however, that we know of, over tincture of iodine.

In some samples of collodion made with anhydrous ether and alcohol, it is difficult to obtain a dense creamy film; a thin opalescent effect, giving a feeble picture only being obtained, even by prolonged immersion in a strong nitrate bath. Where this effect is observed, and at the same time a disposition on the part of the film to repel the silver solution, it probably arises from the aqueous solution of silver penetrating the iodized film with difficulty. A few drops of distilled water to each ounce of collodion will at once open its pores sufficiently to allow the free permeation of the silver solution, and a dense creamy film, giving a brilliant image in place of the feeble picture before produced, may be at once obtained.

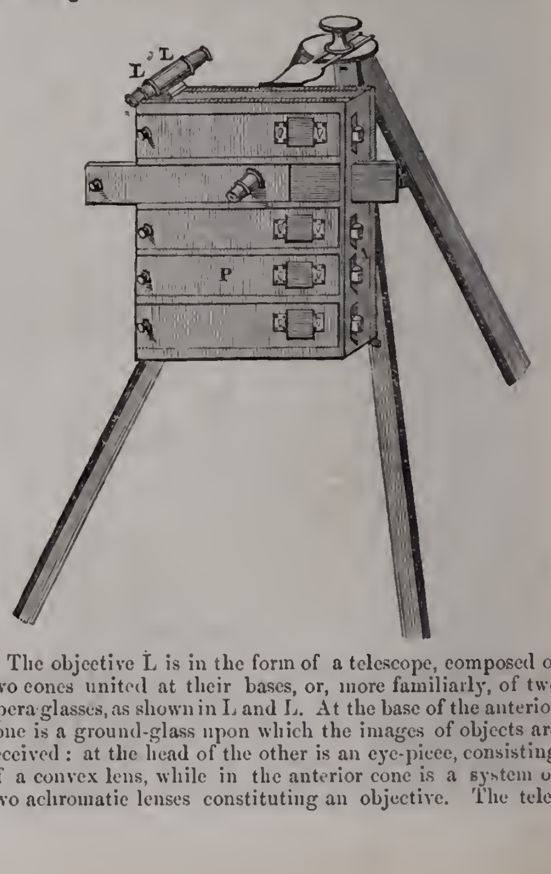
The addition of various kinds of organic matter, and other substances, either as accelerating agencies, or as giving increased intensity, is generally undesirable. We have tried various kinds of essential oils and hydrocarbons, various gums and resins, acids and acetates, hydrochloric acids and chlorides, &c. &c. &c. In many cases a slight advantage is gained for a short time, but always at the expense of subsequent loss, and we do not at all recommend the use of any of them. Good pyroxyline, pure ether and alcohol, in about equal proportions, or with an excess of the latter; pure iodides and bromides, in the proper proportions, are all that are needed in the collodion to give good iron negatives. The bath and developer must, of course, be in harmony; and these we shall consider next week.

THE POLICONOGRAPH.

INVENTED BY M. JULES DUBOSCQ.

M. Duboscq, who has already rendered many important services to photography, has recently invented an apparatus specially intended to enable an operator to obtain a large number of views during a journey; and to which, consequently, he has given the name of *The Travelling Policonograph.*

This apparatus is composed essentially of three parts:—the camera, the tripod, and slide: it is represented adjusted for taking views in the annexed woodcut.



The objective L is in the form of a telescope, composed of two cones united at their bases, or, more familiarly, of two opera-glasses, as shown in L and L. At the base of the anterior cone is a ground-glass upon which the images of objects are received: at the head of the other is an eye-piece, consisting of a convex lens, while in the anterior cone is a system of two achromatic lenses constituting an objective. The telescope, as shown in L, is placed on the tripod, and fixed by means of a screw.

The camera P is a large frame, at the bottom of which the sensitized collodion plate is placed, while in the dark room. The upper surface of this frame is complex in its arrangement. At A is seen a series of five double slides, the shutters of which move in opposite directions. Upon the upper shutter the anterior cone of the telescope is fixed: each row is divided into three parts by black, vertical screens, and the opposite motion of the shutters has the effect of bringing these three spaces opposite the telescope, and of proportionally uncovering the part of the collodioned plates corresponding with them. In this manner we can obtain three views in a row, and, consequently, fifteen views upon the entire plate.

The distance of the objective from the ground-glass exactly represents the thickness of the camera: if the objective is focussed upon the ground-glass, it will be so also upon the sensitized plate.

The frame is furnished with two screws upon its upper portion, in which the telescope is fixed by means of a bayonet-joint to obtain the focus. On the two fore feet of the tripod are two hooks which hold the frame during the operation: this mode of suspension is much more stable than that adopted in ordinary apparatus.

The operator proceeds in the following manner:—With the complete telescope in his hand, he selects the landscape or other object he wishes to photograph; then fixing it upon the frame placed on the tripod, he focusses the object on the ground-glass. Then separating the objective and placing it on the first row, the frame already resting on the legs of the tripod, he works the shutters, proceeding in the ordinary manner to take as many negatives as may be desired, without any other labour than that of working the slides of which he moves the notches marked 1, 2, 3, &c., in succession, and the catches which hold them during the exposure. The plate with its fifteen negatives may remain in the frame until it is convenient to develop it. On regaining the operating room the plate can be developed and fixed, and positives printed from it in the usual manner, or the negatives may be enlarged, if desired. An amateur who wishes to avoid as much trouble as possible, has only to provide himself with a sensitized plate, which, after exposure, he can send to a professional photographer to be developed, fixed, and printed. The complete apparatus is extremely portable; the frame can be placed in a carpet bag, the camera in the pocket, while the tripod serves as a walking stick.

Thus a very interesting question has been solved in a very simple way by M. Duboscq. Artists as well as amateurs will find it to their interest to photograph landscapes and architecture, and thus obtain exact models which they can afterwards convert, at their leisure, into artistic pictures, in their studios, and it is certain that painters would frequently have resource to photographs if its processes were sufficiently simplified.

COLLODION-PHOTOGENE FOR POSITIVES AND NEGATIVES.

BY M. MC. A. GAUDIN.

Having, in my researches upon washed collodion plates, become satisfied that the nature of the developing agent, and the mode of developing, have the greatest influence upon the intensity of the pictures, I have resumed the preparation of a *photogene*, and I have the pleasure of announcing to my readers that I have succeeded in preparing a photogene which has yielded me positives as white as snow, and printing negatives of extraordinary purity. I cannot now state exactly how it is composed, for its preparation was of a very complex nature; but the fact is quite certain, and, as I have frequently stated, the photogene will soon replace collodion sensitized with nitrate of silver.

At present, I operate in the following manner:—I pour upon the plate some photogene, which is of a greenish yellow in the mass, and of a very pure opaline colour on the plate: thus prepared, the plate is at once ready for use, but in all probability it will retain its sensibility for an indefinite period, for the photogene never dries.

After exposure in the camera, the plate is washed in the acidulated water intended for sensitized plates; when it ceases to appear *greasy*, a pyrogallic developing solution is poured on; and when this latter has become thoroughly imbibed, nitrate of silver, of the strength of 3 per cent. is added, which causes a splendid picture to make its appearance.

At present this photogene requires an exposure double in length to that of ordinary sensitized collodion; but as it is found to be fifty times slower in obtaining positives on paper than certain impenetrable photogenes I had prepared previously, there is nothing to fear on this score, and I have not the least doubt of being able to prepare photogenes which will leave nothing to be desired as regards sensibility.

I have endeavoured to ascertain whether the photogene retains its sensitiveness for any length of time. After coating a glass plate with it I placed it in my little apparatus, the diaphragm of which consists of a piece of card-board pierced with a pin-hole, with a diaphragm of 7 millimètres; this apparatus gave me a negative upon collodion sensitized in the usual manner, after an exposure of 10 seconds, with a simple achromatic lens. My photogene was about twice as slow, it required 20 seconds with this latter diaphragm, and fifty times as long with the pin-hole aperture; that is, 1000 seconds, or a good quarter of an hour; but I left it two hours in position, and upon proceeding to develop, I obtained only a fraction of a sky with the distance, as a very weak positive.

I do not conclude from this failure that my photogene will not retain its sensibility a notable length of time, because my apparatus was in an extreme condition; it was exposed to full sunshine at the back, and when I examined the plate before development I saw it was covered with liquid globules, having evidently undergone a sort of cooking, which doubtless destroyed its sensibility.

Immediately afterwards, I took a negative with the same photogene, and with the aperture of 7 millimètres; this negative I found perfect in every respect, and upon comparing its sky with other skies upon negatives obtained by the ordinary process, the sky of the photogene appeared to me twice as intense.

In leaving out of consideration for the present the question of permanence of sensitiveness, which I am induced to attribute to the photogene, a question I shall immediately solve, it remains established that the photogene can be substituted for collodion sensitized with nitrate of silver, and that even washed collodion itself already appears to have become an old story.

Yesterday I again experienced considerable difficulty in preparing a fresh supply of photogene that would work well; but I have thought of a process which will enable me to prepare it with mathematical precision, as I shall be guided in the proportions by a well-marked change in its colour; and I now perceive that I shall be able to prepare a photogene with albumen, which was impracticable by my former method.

Thus we shall soon have photogenes of collodion, gelatine, and albumen, and then photography will be greatly simplified and rendered much more attractive.

By employing the inexhaustible resources of chemistry, we shall arrive at obtaining preparations possessing perfect porosity, and as I have already obtained impenetrable collodion photogens upon glass, but more sensitive upon paper than the most rapid collodion, we cannot doubt that a brilliant future is reserved to this improvement.

In this manner everything becomes possible, and I have no doubt of the preparation of an extra-sensitive photogene, which will serve an indefinite time after being poured on the plate; for I perceive very clearly that the means exist of rendering the photogenic preparation rigorously insensible to every influence, except actinic power, at the ordinary temperature.—*La Lumière.*

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Hydrocyanic Acid.—Although this acid is only very rarely used in photography, and is too deadly a poison to render it advisable for any unskilful person to dabble in its preparation, yet this series of acids would be incomplete were we to omit all mention of it. Hydrocyanic, or prussic acid, is always prepared by the reaction of sulphuric acid upon ferrocyanide of potassium. 10 parts by weight of the latter are mixed with 7 parts of oil of vitriol which has been previously diluted with thirty or forty times its bulk of water. The ferrocyanide should be well powdered and the mixture placed in a glass retort and submitted to careful distillation. The greater part of the hydrocyanic acid goes over in the beginning of the distillation at a temperature somewhat above 212° F. A good condensing apparatus is therefore necessary, otherwise the hydrocyanic acid which passes over first, since its boiling point in this concentrated form is not above 81° F., will, for the most part, escape in vapour along with the air in the apparatus. To avoid this loss as well as the great danger to the operator's health which its inhalation would cause it is advisable to have water in the receiver into which the concentrated acid can condense. The retort must be so arranged as to prevent any of the contents from spirting over, and the receiver should be surrounded with ice. As soon as two-thirds of the liquid have come over, the distillation may be stopped. The liquid in the receiver should be transparent and colourless, it should have but a very transient and feeble action on litmus. It has a very powerful odour somewhat resembling oil of bitter almonds, but more stifling; its taste is bitter and pungent; it destroys life more quickly than any other narcotic poison, a fraction of a drop of the strong acid being almost instantly fatal, and even its vapour when inhaled producing coughing, giddiness, and headache. The acid is very prone to decompose, producing cyanide of ammonium, formic acid, and a variety of brown substances.

The acid which is distilled over in the process given above will be of unknown strength, and since it is very important that the exact amount of anhydrous acid which it contains should be known, its strength should be ascertained. The best plan for estimating this is the process known as Liebig's. The hydrocyanic acid is mixed with a solution of caustic potash until a strong alkaline reaction is produced, and then with a graduated solution of nitrate of silver until the liquid begins to show signs of turbidity. 1 atom or 108 parts by weight of silver used will correspond exactly to 2 atoms or 54 parts, by weight, of anhydrous hydrocyanic acid.

Hydrocyanic acid is not liable to intentional adulteration. It may, however, contain several impurities arising from the mode of manufacture adopted. These may be sulphuric, hydrochloric, nitric, tartaric, or other of the stronger acids; sulphuretted hydrogen, ammonia, oxide of lead, cyanide of mercury, formic acid, and hydrosulphocyanic acid. The *strong acids* may easily be detected by the fact that blue litmus paper dipped into the liquid is turned instantly blue, and remains so after a day's exposure to the air. *Sulphuric acid* may also be shown by the turbidity produced in the liquid by a solution of chloride of barium in the presence of a drop of nitric acid. *Hydrochloric acid* may be detected by adding excess of ammonia and evaporating the solution to dryness on the water bath, if pure there should be no residue. The residue, if any, dissolved in water, and mixed with nitrate of silver and nitric acid, will give the well-known white precipitate of chloride if this contamination is present. *Sulphuretted hydrogen* may be known by the brown precipitate which is given by it to a solution of cyanide of mercury. *Ammonia* causes the acid soon to turn brown, it may be recognised by the white cloud which it forms with hydrochloric acid when a glass rod moistened with this acid is brought near the liquid to which an excess of potash has been added. *Oxide of lead* is easily known by the dark colouration given to it with sulphuretted hydrogen. *Cyanide of mercury* will be left behind when the acid is evaporated to dryness at a gentle heat. Formic acid is not an uncommon impurity, as it is produced by a slight excess of mineral acid in the process of manufacture; it may be recognised by dissolving a little mercuric oxide or cyanide of mercury in the liquid, and then heating to the boiling point; formic acid will cause the reduction of the mercury to the metallic state, which will precipitate in minute grey globules. *Hydrosulphocyanic acid* is at once known by the deep red colour produced in liquids containing it upon the addition of a drop of perchloride of iron. If a little of the hydrocyanic acid leaves any residue upon evaporation to dryness over the water bath, it may consist of phosphoric or sulphuric acid, sulphate of potash, prussian blue, bitartrate of potash, oxide of lead or cyanide of mercury.

The presence of hydrocyanic acid in any liquid is detected in a very simple manner. The suspected liquid is placed in a watch-glass, this is covered with another which is moistened with a drop of sulphide of ammonium. After a few moments the upper watch-glass is gently heated till the sulphide of ammonium is dry, and the dried residue is treated with perchloride of iron. A blood-red stain is produced if hydrocyanic acid has been present in the liquid.

Hydrocyanic acid being such a deadly poison, it may not be inappropriate to devote a few lines to its physiological action, and the proper remedies to be taken in case of poisoning by its means. The ordinary prussic acid met with in shops is a mixture of anhydrous acid with water, the strength varying from two per cent.—that of the London Pharmacœpia, and Scheele's acid which contains five per cent. Even these dilute forms are very fatal in their effects, inhalation of the vapour of Scheele's acid having on more than one occasion proved almost fatal. Taken in the liquid form, as small a dose as twenty drops of Scheele's acid is considered to be sufficient to destroy life, the symptoms following one another with alarming rapidity, commencing sometimes even before the act of swallowing is accomplished, and death ensuing in from a few minutes to a few hours. The symptoms are perfect insensibility, the eyes fixed, prominent, and glistening, the pupils dilated and unaffected by light, the limbs flaccid, frothing at the mouth, the skin cold, and covered with a clammy perspiration; there is a convulsive respiration at long intervals, and the patient appears dead in the intermediate time; the pulse is imperceptible. The respiration (when the patient is not very far gone) is slow, deep, gasping, and sometimes heaving, sobbing, or convulsive. It must not be supposed that the poisoning action of this acid is only liable to take place when the acid itself has been taken. In many photographic operations, especially now that cyanide of potassium is coming into vogue again as a fixing agent, there is quite enough vapour given off from the solutions of this salt to produce alarming effects. Indeed we have known an instance where an operator who had been for some time experimenting over a dish of cyanide of potassium solution was suddenly seized with unmistakable symptoms of poisoning. He suddenly felt a pain in the back of his head, this was quickly followed be noises in the ear, giddiness, difficult respiration, and ultimately he fell down unconscious. In manufactories where electro-plating or gilding is carried on, cyanide of potassium being largely used as a solvent for the metals, it is not at all an uncommon thing for the workmen to be affected by slight symptoms of poisoning, since a solution of cyanide of potassium is always evolving prussic acid into the atmosphere.

The method of treatment in cases of poisoning by prussic acid should be adopted without a moment's delay. The nearest medical man should be instantly sent for, if a messenger can be spared, but in most cases he arrives too late. Death by prussic acid is like death by lightning—the person in general either dies speedily or recovers altogether, death taking place as early as the second minute or as late as the fiftieth; those who survive an hour having a good chance of recovery.

The first thing to be done is to deluge the patient with plenty of cold water dashed violently over him, a stream being allowed to flow down the spine and back of the neck. The vapour of ammonia should also be cautiously applied to the nostrils, and stimulating liniments by friction to the chest and abdomen. Internal remedies appear to be of no service, unless taken within a second or two of the poison. The blood is speedily poisoned, and no chemical antidote can reach this liquid to counteract the effects of the poison. If the power of swallowing remains an emetic may be given, and a mixture of sulphate of iron solution and carbonate of soda, but these are seldom of use. Plenty of cold water and smelling ammonia seem to be the only effectual remedies; lose no time in applying these and send for a medical man.

SOME NOTES ON POSITIVE PRINTING.

BY SAMUEL FRY.

As I suppose myself to be addressing readers who have already acquired some knowledge of photography, I avoid entering into those minute details which are indispensable where the beginner is concerned. I do not propose to communicate anything especially novel, but merely to mention a few of the details of my own practice, which will be found useful in the hands of amateurs and others. Probably few amateurs albumenize their own paper, for, as a rule, they cannot obtain extreme smoothness of gloss, and evenness of surface, which is found in paper albumenized by those who do it commercially. I am not myself an admirer of this extreme glaze, but beyond a doubt it gives wonderful detail and definition, and imparts a finished look to a picture, which is admired by many.

I believe it is not, as has been suggested in many cases, produced by very different materials to those commonly supposed to be employed for the purpose, and which, if not deleterious to the print, are at all events of doubtful utility.

Albumenizing.—For the information of those who incline to try their hands at albumenizing, I will give the recipe I employ with much success:—

White of egg	10 ounces
Chloride of sodium	2 drachms

Mix the salt before adding with just sufficient water to dissolve it. Beat up the mixture until the whole is converted into paste, and set aside to settle. When it is to be used, a room should be over-heated to 70° Fahrenheit, and with a good red fire or stove burning. This room should be swept out and dusted an hour before the albumen is poured out, and arrangements made to prevent persons coming in and out during the process, as cold draughts of air cause markings on the sheet by causing the flow of albumen in lines.

Filter the albumen through muslin into a glass dish with wooden sides, and commence by drawing a strip of cardboard over the surface to take off dust or scum arising from the bottom of the dish, and other causes; and having chosen the smoothest side of the paper, float it on the surface by laying the middle down first, and by the ends forcing out air-bubbles. Allow it to float one minute, then remove it, and suspend to dry by means of American clips attached to a cord stretched across the room. Where some of the surface albumen has run down, move the sheet to the front of the fire, and dry it up very rapidly, by this means a very high gloss can be obtained. Do not iron it out when dry, but place it under a board, or in a screw press to flatten it down. I do not use ammonia, acetic acid, or anything else mixed with the albumen, except the water and salt named. With some samples of paper it is very difficult to avoid streaks; and in such case I allow the albumen to stand a few days to become more limpid.

Sensitizing.—I invariably employ, as I have said, for sensitizing and albumenizing paper, a bath made of a stout piece of plate glass, with wooden edges varnished with shellac inside. A method of making them was recently given in the PHOTOGRAPHIC NEWS,* which is almost identical with my own. A much less quantity of solution is required from the perfect flatness of the dish, than for any other kind. I may, perhaps, appropriately mention here that it will be found of very great advantage to mix the sensitizing solution with common or river water instead of distilled; by this simple means may be obviated one of the commonest annoyances in a small way, to which photographers are subject, I allude to the great discolouration of the sensitizing bath after use. When the mixture is first made with common water a cloudy milky looking deposit is seen which gradually settles to the bottom of the bottle, but must on no account be filtered out, as it is this carbonate and chloride of silver which decolourizes the bath, or rather prevents any colour from arising, even after very extensive use of the bath solution. My method is thus, take say—

Crys. Nit. Sil.	8 drachms
Common water	8 ounces.

I place it in a rather tall bottle, agitating until dissolved, then put aside until next day, when it will be found quite clear. The solution being filtered out for use leaves the sediment at the bottom of the bottle; with half-an-ounce or so of this liquid, and after having sensitized the required quantity of paper, return it to the bottle and shake well. My own bath of half-a-gallon has been in constant use for months, with fresh added, and is as clear as spring water. I look upon it as being of primary importance to keep up the original strength of the bath by the addition of fresh crystals occasionally, as, when the silver is reduced to any considerable extent, it is liable or likely to produce three great evils. 1. The resulting proofs are poor and flat when finished. 2. The albumen is dissolved from the surface of the paper in consequence of the strength of silver being insufficient to produce coagulation before the water dissolves it. 3. Mealy brown spots are produced on the paper from the solutions acting unequally. I therefore argue that it is false economy to have a weak printing bath; the now well-known hydrometer offers a perfect security against allowing the bath to become too weak; every photographer should test his bath with it before sensitizing paper, and thus ensure brilliance and vigour in his tones.

Much has been written of late of the advantages of certain specified periods of time for keeping albumenized paper on the silver bath; my own experience leads me to think that in winter or cool weather, say nine months out of the twelve, it should never float less than from three to five minutes, but I have seldom found that ten did any harm, the prints on either paper being indistinguishable from one another; but I do think that injury may result from any further continuance of the operation, and perhaps a safe medium may be from five to seven minutes. *Saxe* paper is frequently absorbent, and will generally require a shorter time than *Rive* paper. Paper dried by the fire after floating rapidly discolours, but if used immediately appears to give increased brilliance and force to prints, probably from the surface becoming more thoroughly dry and ivory-like than is often the case when it is simply hung up to dry in the yellow-room. I recommend it, for ordinary use, to be sensitized in large sheets, suspended to dry in a yellow or dark warm room (carefully catching every drop that falls from it in drying), and when so nearly dry as to begin to curl at the corners, roll it up on an oak or mahogany stick the size and shape of a ruler; when all the sheets are on, one over the other, unless

* See "Amateur Mechanic," p. 261, vol. iii.

the paper is to be used at once, place the whole in a box, or what is better, a long glass bottle, having the bottoms covered thick with common salt, and with a thickness of paper to keep the prepared roll from touching. The deliquescent nature of the salt absorbs from the surrounding atmosphere a large per centage of its moisture, and by this simple means albumenized paper will retain its sensitiveness and pure white colour for three or four weeks, thus saving the amateur, whose time is limited, a deal of loss; independently of which it is far more economical to prepare a quantity of paper at once than to be continually pouring the solution in and out of the bottle.

I have long employed the above principle in my own establishment, and have every reason to be satisfied with its operation.

The less sensitized paper is exposed to the action of even weak daylight the better, for the clearness of the white and half-tones is very materially impaired by that yellowish-brown decomposition of the prepared surface, which arises sometimes in darkness from the spontaneous continuance of an action once set up in daylight. It is much better, when it can be done, never to allow the paper to be out of the yellow room until it is in the point for printing.

Should the printing frames, with screws to produce the pressure, be selected, care must be taken to apply the same force at each corner, and not to put a small negative in a large frame, as the probabilities are that the centre will have no pressure, from the screws being outside the edge of the negative. Again, if frames with springs are used, it requires care, from time to time, to see that the springs do not become too weak, and, therefore, inefficient for pressure.

Never print a picture without a good padding over the paper, or some substitute, as want of sharpness in some part of the picture is sure to be found from the neglect thereof.

Before commencing to print some kinds of negatives, which from defects, or other causes, require more exposure to light in some parts than others, the operator should make certain masks, or blinds, to be used in shading portions of the picture whilst others are going on. These are of simple construction, and are thus made:—The first, and simplest mask, consists of a square piece of stout cardboard the size of the pressure frame, to one or more edges of which is attached cotton wool by means of gum. This, when dry, is drawn out by the point of a pin, or a common comb, until it presents the appearance of a white fringe, projecting an inch from the edges. By judicious arrangement in masking the parts required, whether in the sky, the background, or other portion of the negative requiring less light, most charming effects are produced, and defects, at times, converted into improvements. Again, by placing here and there, on the outside of the pressure frame, at certain stages of the printing, a piece of wool to retard dark, sombre shadows, the resulting prints may be much improved if needful. The following description of mask will also give very fine results under certain circumstances:—Take a piece of cardboard, larger than the frame, and make an oval hole of any convenient size. If a set of 6 cards be made, with holes from $\frac{1}{4}$ up to $1\frac{1}{2}$ inch in the centre, it would be well, and gum round these apertures cotton wool, as before described. The use of these masks is seen at a glance; any obstinate fogged piece of negative, that ought to give us depth in the joint, may, by having this mask placed over it, moving the card about occasionally, be kept exposed to light, whilst the rest is obscured.

The system of masking, or "dodging" pictures, is one that in my opinion should only be attempted for the improvement of imperfect negatives, or those, which from accidental causes are defective as photographs, but exhibit artistic qualities, or pictorial beauties, which render their perpetuation desirable.

Under very favourable circumstances negatives may be now obtained, which contain within one plate every variety of cloud, atmosphere, animal life, and moving objects, rendering composition photography comparatively unnecessary; but it may well happen sometimes that the want of a sky, the presence of a stain, &c., may mar an otherwise good result; under these and similar circumstances alone, are these maskings permissible.

In every case the shading, &c., is to be conducted at the earliest stages of the printing, in order that the subsequent printing of the general body of its picture may obliterate any slight shade or hard line at the edges of the parts masked, as a little general exposure of the whole of the picture (in the printing-frame, and under the negative, of course), will tone down, or soften and blend edges, which in the masking process have become a little too much defined.

Whilst on the subject of paper printing, I may be allowed to advert to the extreme importance of avoiding all contact with the surface of the paper as much as possible. Warm or damp fingers touching albumenized paper on the prepared side, whether sensitized or not, are almost certain to cause marks which cannot be removed by subsequent treatment, and of course if the hands which caused these defects have been employed in other chemical operations, more particularly in fixing prints involving the use of hyposulphite of soda, the danger is greatly aggravated of spoiling a considerable quantity of paper.

In this matter probably nothing is a more certain preventive of conducting toning and sensitizing together by one process, than for the operator to be able to trace, on any particular occasion, the loss of valuable time and prints to this cause; the inclination is so natural, and the practice so common of endeavouring to economise time by those whose opportunities for photography are short and rare, that it cannot be a matter of surprise that the thing should often be attempted, and the blemishes attributed to other causes.

The subject of toning and fixing will require some separate notes on a subsequent occasion.

PHOTO-SCULPTURE.—A NOVEL PROCESS.

The following letter and editorial comments we find in the *American Journal of Photography*:—

Sir,—Having noticed in the *Scientific American*, of July 6, 1861, an article copied from the Photographic News, claiming that photographs can be taken in "Relief." I take the liberty of communicating to you a process by which, some eighteen months since, I took similar pictures; not with any degree of perfection, but of such a nature as satisfied me that the principle would make copies of any object of one colour in basso-relievo, correctly representing the original, in which copies or shells, any number of casts could be taken in plaster or other cold material, for similar purposes.

The process by which I made the representations spoken of was as follows:—

On a very thin sheet of gutta-percha, fastened on a frame by the four sides, I spread a coating of gum arabic mixed with bichromate of potash. When dry I exposed it to the light under an ordinary portrait negative, after which I dissolved away the soluble gum and dried it.

Thus far I copied nearly after the "carbon printing" process.

This sheet was now part elastic and part non-elastic. I next levelled the frame containing the picture with the printed side down, and poured warm water on it, which caused the gutta-percha to stretch where it was not covered by the gum, and allowed the high-lights to protrude and form "basso-relievo." Thus far everything worked to my satisfaction and expectation. I then allowed it to cool, when on turning it over, I discovered that the shirt bosom protruded far beyond the coat, making an unnatural representation.

I had not the time or material then to continue my experiments, but enough was gleaned from them to satisfy me that from objects of one colour, such as statuary, &c. (backed with practice), good copies could be made. Other gums than the one named might work better.

Having heard doubts expressed as to the plausibility of the process spoken of by the Photographic News, I have given you the result of my experiments as being the probable mode employed by Mr. Willeme.

My experiments and description are, of course, incomplete from the short time that I could spare upon them, but I have gone far enough to convince me that the principle of an elastic and a non-elastic gum is correct. Some of our enterprising Americans who have more time to spare can no doubt bring it to perfection. T. Cummings.

Lancaster, Pa., July 16.

[The above process is not at all like Willeme's; in our opinion it is far more ingenious, novel, and perhaps useful. Mr. Cummings' is the genuine photo-nature sculpture; Willeme's requires more of the handiwork of the human artist.

Willeme's process is briefly this: he sets up his model (a piece of satuary, for example), and makes a series of photographs of it all around it, and from the camera stations all in the same horizontal plane. These views will be profiles, *silhouettes*, or sections of the model. The sections, properly mounted on cardboard or metal and trimmed, are now set up and fastened together, so that the common line or axis shall coincide, and so that the several sections shall have their other proper relations to each other, and the work begins to assume the solid form; it is only necessary that the spaces between the sections be filled with plaster or wax, and the surface be smoothed and worked up by the artist.

The whole subject is interesting and suggestive. There is a fine field here opened for speculations and experimentations. We earnestly hope that Mr. Cummings will not abandon his brilliant idea.

It will be observed that Mr. Cummings' process will give form only to light and shade of the model, and that in no case will this form be the same as that of the model; a face, for example, will be wonderfully prominent on the side which is most illuminated. We shall thus have a new art; what shall we call it? Actino-light and shade-sculpture?—Ed.]

THE VALUE OF PHOTOGRAPHY.

The wisdom of the world, like its own physical phenomena, has its cycles; and civilization, like the pendulum, swings across an arc with slow but certain motion. The life of a nation has been compared to the tidal currents of the ocean; and habits, manners, customs, and fashions most surely ebb and flow. Thus, though the stream of modern civilization moves ever forward, it needs but little fancifulness to discover an occasional point in which we, nineteenth century folk, have reproduced the habits of our forefathers; generally, we must say, greatly improved upon and refined. Perhaps there is nothing in which this tendency is more noticeable than the revival of the pictorial instruction of olden days, which has been brought about by the introduction of photography; for that "pictures are the books of the unlearned" is a dictum quite as true to-day as it was when uttered by the fathers of the church—those fostering parents of education—fifteen centuries ago. But it is not now the ignorant alone who learn useful lessons from the photographer's art; on the contrary, our highest intellects and keenest eyes call in its aid to their assistance in the discovery and registration of some of the most magnificent as well as most minute facts of physical science. Without this magic artist at command, the astronomer, the meteorologist, and the chemist, together with many other investigators, would be deprived of one among the most powerful of scientific divining rods. How would it have fared, for instance, with our wise men this last summer, in Spain, without the camera and the sensitive plate? A hundred telescopes might be levelled at the lessening solar disc, and a hundred trained observers note with astonishing accuracy every visible phenomenon of eclipse; but each eye is more or less fallible, and looks only for a few seconds on new and startling appearances. The lens and the collodion, however, are observing too; the fleeting nature of the picture is as nothing to the obedient chemicals, and while human eyesight, and human memory, at their best, can do little more than carry away a faint and confused impression of the sight, *they* will take and retain an exact and lasting image of the strange and important appearances which accompany the event.

It is impossible to avoid comment upon the extraordinary development which marks the history of this art, and the enormous range over which its operations extend. It is difficult, in passing along the Strand or Regent Street, and noting the number and importance of the shops devoted to the sale of photographs, to realize the fact that all these results have sprung from labours so recent as those of Daguerre, Archer, and Mr. W. H. Fox Talbot. Twenty years ago the daguerreotype was an expensive means of getting a bad likeness; and now, for an absurdly small sum, we may become familiar not only with every famous locality in the world, but also with almost every man of note in Europe. The ubiquity of the photographer is something wonderful. All of us have seen the Alps, and know Chamounix and the Mer de Glace by heart, though we have never braved the horrors of the channel. The pyramids of Egypt would fail to astonish the most ingenuous of British schoolboys. We have crossed the Andes, ascended Teneriffe, entered Japan, "done" Niagara and the Thousand Isles, drank delight of battle with our peers (at shop windows), sat at the councils of the mighty, grown familiar with kings, emperors, and queens, prima donnas, pets of the ballet, and "well-graced actors." Ghosts have we seen and have not trembled; stood before royalty and have not uncovered; and looked, in short, through a three-inch lens at every single pomp and vanity of this wicked but beautiful world. —*Once a Week.*

Photographic Tourist.

MY FIRST PHOTOGRAPHIC TOUR—*Continued.*

Out in the morning early. The rising sun saluted us as strangers rarely visible to him and the hour, as we, inhaling the fresh enjoyable air, and discoursing hopefully and cheerfully of our future, soon found ourselves at the railway station one good hour before the time of starting.

We were not alone in our foolish eagerness to get away. A poor, little, hard-handed servant wench, who had toiled in some dull kitchen—kitchens are seldom anything but dull—for five long years without a holiday, was about to visit her friends and relatives at Norwich, for "a whole month, mum, a whole month," as she, bursting with the gladness and importance of the fact, exultingly told my wife; adding that she had already been at the station "a whole hour," and almost thinking, perhaps, that her haste decreased the time which separated her from those at home. And there she was, full of glowing anticipations, smiling at every thing, with eyes full of pleasure, making confidants of all who came near her, and evidently considering such glorious news as she was full of far too precious to be selfishly hoarded. Moving restlessly to and fro in a flutter of joy and impatience; now asking when she could get her ticket, or where she was to pay, or what time the train reached Norwich; and every now and then bursting forth to some new confidant with "*a whole month, mum, a whole month!*"

In due time the tickets were got, the luggage seen to, and ourselves esconced in some comfortless cages ignominiously labelled "for the working classes," where we were speedily jammed into the smallest possible space, with our knees fitted neatly between those of the opposite travellers. Thus, with puffing and clanging, and banging and rattling, away went we, our only source of amusement in the close hot den being the incessant talking of a tall dame on the one side, the melodious cries of some unhappy infants on the other, and the coarse chaffing of a drunken farmer in our front, so that we were not grieved when the train stopped, the shout of "m'fard" greeted our ears, and the name, Chelmsford, greeted our eyes.

Descending from the station to the earth we passed between two rows of little wooden houses, and some modern brick buildings of the true cockney cut, and so on to the market-place, with its dusty statue of Justice Tyndall, poring over a black no-lettered volume, and doing treble duty by also supplying water and supporting four small lamps.

Proceeding to hunt apartments we went through the High-street, no very great distance, but which, nevertheless, with one or two streets on either side constituted the *county* town of Chelmsford. In the course of our rambles we discovered the Shire Hall, of which the inhabitants are proud, the Literary Institution, which the inhabitants, of course, neglect, the Religious Tract Depository, which the inhabitants support, and a vast array of beer-shops and inns, which are more flourishing than all the rest put together.

Seeking some economical refreshments—for a guinea isn't much to start, in a strange town in a new business, with, is it?—we made our way out of the town to a little road-side public-house, and sat down in its parlor, on an oaken seat, which was also a locker, with our feet on the sanded floor, and some home-made bread and Dutch cheese (*without plates*), and some beer in an earthern jug, on the white, well-scrubbed deal table before us. It wasn't a luxurious meal, certainly; but what of that, we enjoyed it. Afterwards we engaged a bed here, and a very snug, snowy, little nest it was, with quaint, old windows containing small diamond panes of green glass cased in lead, also having a very large share of timber, and curtained with clean check curtains; the whitewashed walls were spotless, and the flooring nearly as white, and there were white curtains, and a white counterpane, and such neatness and cleanliness there apparent as I believe one never meets with anywhere out of England. Here, soundly and sweetly, after the fatigues of the day, we fell asleep, having first secured some cheap apartments, of which we could take possession in a day or two, for our first venture as travelling photographers.

A long country ramble occupied the next day, our food still being bread and cheese, and our hearty enjoyment of such humble fare a thing to be envied by many holders of a pampered appetite, or never-hungry lot. So pray don't waste pity on us, for we didn't deserve it. Our dinner that day, I remember—oh! so well—was taken in the shadow of a fine old tree which stood upon the sunny slope of a hill; a splendid prospect was before us, and a full band of feathered minstrels were making music for us the while. I have sat down to a table groaning with the richest luxuries since then, but never enjoyed a meal so well as I did that. There was not a soul near, the magic of the glorious sun hung glistening diamonds on the leaves, burnished the gleaming blades of grass, gilded the rough old bole of the tree, bathed the distance in a radiant flood of glowing light, and seemed to defy us to be ought but gay, and hopeful, and care-defying, and merry; aye, and vocal, for after dinner we lay on the grass and sang to one another, sang as the birds sing, out of sheer joy and our instructive sense of freedom.

You are mocking us, perhaps; you think us idle, thoughtless, and careless: think, may be, that we ought to have been sitting tearfully, hand locked in hand, with visages drawn out to their longest, contemplating our sad position with mournful earnestness and making ourselves supremely miserable. We were not so soft, my good friend, the troubles would come if they were to come, but as to going a long way to look for and meet them, that was not set down in our list of intentions, and we didn't do it. They came, as, alas! you will see, but we fought none the worse with them for the strength we obtained from encouraged hopefulness.

To shorten my story. We got into our apartments, and when we had recompensed the man with his truck for conveying our luggage from the station, and paid the first week's rent in advance, we possessed in cash just *one shilling*.

I had prepared a case of specimens with the aid of my instructor in town, and now proceeded to unpack the same, but when the lid of the packing case was removed—Oh! horror!—there lay the case with its glass shivered to pieces!

With a muttered d——n, I looked from this unfortunate case up to my wife, whose eyes were full of tears as she came to my side, and looking without a word up into my face with her loving mournful smile, kissed me. I pressed my lips passionately to her dear little face, and then set to work to remedy the evil by spending my last shilling with a glazier, who cut the remnants into square pieces, which with gum and paper and metal "mats" I contrived to convert into a number of small cases for the reception of our specimens; and when they were thus protected, I fitted them as neatly as I could into the unglazed frame again, and so got it ready for exhibiting. At half-past twelve o'clock that night, we went supperless to bed, laughing that we had so well conquered our terrible misfortune.

"Can't you contrive to dream that you've had your breakfast before we get up in the morning," said my patient and affectionate little partner as cheerfully as ever.

"I never felt any the less hungry for such a dream," said I, "but suppose we try, darling."

We didn't succeed though.

R. A. S.

Mechanics.

THE BOW TENT.

Dear Sir,—If you consider the following contrivance for a tent worthy the attention of your readers, it is at your service. Its principal advantages are lightness and commodiousness. I must not take up your space by going into those minutiæ which every mechanical mind will supply, but will merely state the principles upon which it is constructed.

A box 18×18×4, opening with card-table hinges across the middle, forms the table. In the four corners are four square holes, placed in a diagonal direction to receive four rods, jointed with square ferules. These rods support the table and form the support for the tent, which is of a cubical form, 36 inches in dimension or would be so, but that the front staves are twelve inches higher than the back ones, to give head room. All this is common-place enough. The peculiarity of my tent, which I will call the Bow Tent, consists in these four rods being strained into the form of bows bending outwards by strings simply contrived for that purpose, by means of which the calico is stretched tight at the top and sides, and the legs are stretched out so as to form a firmer support.

The front bows being the longest, extend back, so as to form a canopy for the accommodation of the artist, who ties *himself* into, or *the light* out of, his tent, as occasion requires, by means of a string, which runs in a "hem" round the aperture. The bow system gives great rigidity to the tent, the legs of which, forming the lower part of the bow, taper from $\frac{7}{8}$ to $\frac{5}{8}$, and the upper portions taper for $\frac{5}{8}$ to $\frac{3}{8}$.

The covering, and a 12×10 plate camera, pack easily into the box, while the legs are bound up with the tripod stand.

Spoon Plate-Holder.

Another contrivance, which may perhaps be of more general utility, is a plate-holder which I will designate from its form the Spoon Plate-holder. I have really found great convenience from its use in the almost perfect freedom from finger stains which I have enjoyed since its adoption. I use it principally for developing, &c. plates 12×10 and under, to which it adheres with great tenacity, and it is useful in drawing plates out of grooved boxes, for which its form adapts it.

A tin pipe, with a bore as small as possible (the tube and bore being about the size of the tube and bore of a tobacco pipe) is fixed to a tin disc, about $2\frac{1}{4}$ inches in diameter, which is perforated to correspond with the bore of the pipe. On the other side of this disc, the convex side, for it is slightly hammered, a rim $\frac{1}{8}$ of an inch high is soldered $\frac{1}{4}$ of an inch distant from its circumference, and a "ribbet" is thus formed, round which an annulus of india-rubber $\frac{3}{16}$ of an inch thick, $\frac{1}{4}$ inch wide, and about $1\frac{3}{4}$ diameter is stretched, and if necessary cemented with marine glue; the other extremity of the pipe, at six inches from the disc, swells out into a semi-cylinder 3 inches long and $\frac{5}{8}$ or $\frac{3}{4}$ inch diameter, round the outside of which a thin piece of wire is soldered to strengthen the mouth of the cavity.

A piece of vulcanized india-rubber tube, $\frac{1}{2}$ or $\frac{5}{8}$ of an inch diameter, is then slipped over the semi-cylinder—the tighter it goes on the better—and tied at both ends: a drain is thus formed at the handle of the instrument, and if, when it is grasped, the extremities of three or four fingers are thrust into it, the india-rubber annulus being gently pressed upon the surface of the glass to be raised, a very strong adhesive power is produced, which I have never yet known to fail. As a precaution, however, the thumb can be pressed lightly on the vulcanized india-rubber, the concavity of which will, of course, be a measure of the adhesion of the instrument.

The handle and tube being nearly in the same plane with the surface of the india-rubber annulus, the fingers are quite out of the way of any liquid that may run off the plate.

To any person who wishes to have one of these holders made, and I strongly recommend a trial, I beg to suggest:—

1. The disc must be as curved as possible, the edge being a little turned back to allow the india-rubber annulus to lie flat on the glass.

2. The tube must be as small as is consistent with sufficient rigidity and a free passage for the air.

3. The semi-cylinder must be made to fit the three fingers, allowing for the vulcanized india-rubber, the object being to exclude as much air as possible.

To any one who wishes to purchase the holder without the trouble of superintending its manufacture, I beg to recommend Mr. Rendle, of Ilfracombe, who I have no doubt will supply one according to my pattern at the moderate charge of one shilling, without the india-rubber, which was what mine cost.—Yours truly, M. A.

Miscellaneous.

How the Telescope was Invented.—We have spoken of the telescope as an *enfant trouvé*. The matter of its invention is said to have been in this wise:—Once upon a time—two hundred and more years ago—the children of a spectacle-maker were playing with some of their father's glasses before his door. They poke them here and there, till—what is it they see? The distant steeple appears to be brought almost into their own street. Paterfamilias is apprised of the phenomenon. He verifies it, but it passes his philosophy to tell the youthful inquisitors "the reason why." Like a sensible man, he screws the glasses on to a board, casts a covering about them, and secures the fact. The "spyglass" played subsequently far too grand a *rôle* not to attract the envious glance of national rivalry; and we have, in fact, the same legend repeated by more writers than one, always, of course, with a patriotic change of the place. The learned and unfeeling *savans* of the present day declare the stories to be all fudge. "The number of competitors for this honour," observes Sir David Brewster, "affords the most unequivocal evidence that the telescope was brought into the condition of a portable and efficient instrument by steps so gradual, that no individual had any real claim to be considered as its inventor." Ugh! for the Herod of our Innocents of Invention! We claim the honour for our little Flemings, and crown Middelbourg as the "Stammort" of numerous and refined family of the Dollands of our day.—*Macmillan's Magazine.*

Varnishes.—Very superior varnishes are now made with a solvent composed of highly rectified alcohol and benzole, instead of using, in the common way, alcohol alone. The alcohol should be nearly pure, and equal portions of it and the benzole mixed together. The following are different varnishes made with gum-resins and the alcohol benzole solvent:—1. For carriage varnish—copal, 28 oz.; amber, 8 oz.; anime, 4 oz.; camphor, $\frac{1}{2}$ oz.; solvent, 1 gallon. 2. Varnish for external use—copal, 28 oz.; amber, 4 oz.; anime, 4 oz.; camphor, $\frac{1}{2}$ oz.; solvent, 1 gallon. 3. Furniture varnish—copal, 24 oz.; shellac (bleached), 8 oz.; olibanum, 4 oz.; camphor, $\frac{1}{2}$ oz.; solvent, 1 gallon. 4. Picture varnish—copal, 20 oz.; damer, 12 oz.; mastic, 8 oz.; solvent 1 gallon. 5. White hard varnish—copal, 8 oz.; mastic, 16 oz.; sandarac, 4 oz.; camphor, $\frac{1}{2}$ oz.; solvent, 1 gallon. 6. French Polish—shellac, 32 oz.; solvent, 1 gallon. 7. Another French polish—shellac, 32 oz.; olibanum, 4 oz.; solvent, 1 gallon. 8. Varnish for prints and maps—mastic, 16 oz.; sandarac, 16 oz.; Canada balsam, 4 oz.; solvent, 1 gallon. 9. Varnish for iron (to be applied hot—resin, 12 oz.; sandarac, 16 oz.; seed lac, 6 oz.; solvent, 1 gallon. Preparations of lacker—1. Sandarac, 26 oz., shellac, 6 oz.; turmeric, 6 oz.; gamboge, 1 oz.; solvent, 1 gallon. 2. Seed lac, 18 oz.; amber (fused 6, oz.; gamboge, $\frac{1}{2}$ oz.; dragon's blood, 1 oz.; saffron, $\frac{1}{2}$ oz.; solvent, 1 gallon. 3. Seed lac, 8 oz.; copal, 4 oz.; sandarac, 12 oz; turmeric, 2 oz.; aloes, 1 oz.; gamboge, 1 oz.; dragon's blood, $\frac{1}{4}$ oz.; solvent, 1 gallon. The benzole and alcohol should be previously mixed together in equal parts, and distilled together with 7 ounces of caustic lime to each gallon. The gum-resins should be reduced to as small pieces as possible before being fed into the solvent.—*Scientific American.*

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 28th August, 1861.

M. Jules Duboscq has invented a portable form of camera for taking fifteen views on one and the same collodioned plate, with a single achromatic lens. He gives the name of *Travelling Policonograph* to this apparatus, and as far as one may judge from appearances, without actual trial, it seems well adapted to the object for which it is contrived.

At the last meeting of our Photographic Society a description was read of an optical instrument invented by Signor Ponti, of Venice, to which he has given the name of *Alétoscope.* The object of this instrument appears to be the application of the principles of the cosmorama to photographic views, in presenting architectural subjects to the eyes of the spectator with the combined resources of a periscopic lens of very large dimensions, provided with a double diaphragm, and suitably illuminated so as to give a correct idea of the original, and to obtain an illusion and a relief based upon principles different from those of the stereoscope.

The Alétoscope is composed of an external casing which serves as a head-rest, and in the interior of which is a large periscopic lens fixed in a frame, which the spectator can move nearer or farther from the picture by means of a couple of screws in the sides of the frame. To diminish aberration and avoid chromatism, one or two diaphragms are placed behind the lens.

The external case is in the form of a truncated pyramid. At the bottom it has a black frame, which covers the white border of the photographic picture, which is introduced by a lateral aperture.

Two large glass reflectors may be arranged at the proper angle to project upon the photograph the light from a window or from a gas-burner placed above the instrument, in front of the photograph, and at about four inches above the case.

The effect is much more brilliant in proportion to the greater intensity of the light with which the photographs are illuminated, consequently the very best effect is obtained by exposing the reflectors to the direct light of the sun, or in bringing the upper reflector to within four inches of the gas-burner.

To render the working of the instrument more convenient, when viewing pictures that are higher than they are broad, and *vice versa*, the anterior part of the case rests upon a circular disc worked by two pullies, and on a pivot in the centre of the back portion. By this arrangement it is very easy to turn the whole instrument through the quarter of a circle, by lowering the screw, and pressing the hand on the circular salient portion. There can be no doubt that this instrument is capable of affording much agreeable and instructive occupation for stay-at-home travellers.

It is very desirable that the poisonous substances at present employed in the photographic laboratory should be got rid of, if possible. There are those who maintain that one at least, cyanide of potassium, may be dispensed with, and now M. Jourdain proposes to relieve us of another, bichloride of mercury.

He says, that after employing all the ordinary means of making his picture appear on the negative after *disiodizing* and complete washing with rain water, when requiring a very intense negative, as of an engraving for instance, he pours alternately upon the plate solutions of sulphide of potassium, and of sulphate of iron. Great care must be taken to wash the plate thoroughly after each application. In this manner he obtains negatives in which the blacks are perfectly opaque, so that even the sun cannot be seen through them, and which consequently give perfect whites on the positive proof, which comes so clear and transparent that it appears as if made with printing-ink.

M. Bertsch has introduced an automatic camera for taking microscopic pictures, upon which he remarks:—"I have for some time past occupied myself greatly with taking portraits, which are so small, that they are only visible with the assistance of a microscope, and which jewellers can set in finger-rings."

Focussing images, which have scarcely the diameter of a pin's head, is certainly one of the most difficult operations of photography. For as we must take into consideration both the chemical focus and the refraction from the wet film of collodion, it can only be obtained after numerous difficult attempts. We also know that even when once obtained, this focus is strictly correct only for objects at the same distance from the camera, which becomes an impossibility when we commence this delicate operation anew, for we generally make a proof either larger or smaller than that first obtained.

M. Bertsch's new automatic camera is based on the same principle as his automatic camera for landscapes, which are to be enlarged in the solar camera. As with this latter, it is only necessary to place this little apparatus, which is a true "instrument of precision," before the object to be copied to obtain a very small image, remarkable for its sharpness. This is accomplished without focussing, for all objects more than 40 inches distant from the instrument, taking the single precaution of placing the camera exactly opposite the object, which is easily performed by means of a level mounted on the instrument. Portraits thus taken, although of microscopic dimensions, are perfectly modelled, and the little landscapes display the finest detail, although of no greater dimensions than a threepenny piece. This ingenious instrument will, doubtless, be gladly welcomed by photographers generally, as it will popularize a charming application of their art, which hitherto has been a monopoly in the hands of a few.

Our Photographic Exhibition, which seems to increase in attraction, rather than diminish, will not close until the end of September. A lottery in connexion with it has been authorized by the proper powers. The price of the tickets is fifty centimes, the number being limited to 10,000. There will be 150 prizes, consisting partly of the principal works in the Exhibition, a good number of other proofs of various subjects, some microscopic pictures mounted as jewels, several large American stereoscopes supplied with pictures now in the Exhibition, and other stereoscopes, with and without stands, furnished also with pictures. The drawing will take place on the twenty-fifth of November next.

M. Giovanetti, in competing for the prize offered by M. le duc de Luyues, has prepared some proofs, part by means of an oil varnish, and part by means of writing ink. He has not described his positive processes, but in indicating certain details of his process for obtaining negatives, it appears that they are obtained on dry collodion without bromides; and that for more than a year past he has made use of a developing solution to which he adds gallic and pyrogallic acids, and tannic acid dissolved in alcohol.

The Imperial Commission on the forthcoming Exhibition of 1862 has appointed the following persons as the Jury on the section of photography:—

M. Bayle Mouillard	*President*, Conseiller de la Cour de Cassation.
,, Delessert (Benjamin)	*Vice-President*, Member of the International Jury of 1855.
Aguado (Count)	Member of the Photographic Society.
M. Bayard	Ditto ditto.
,, Bertsch	Ditto ditto.
,, Courmont	Chef de la division des Beaux Arts, du Ministère d'Etat.
,, Davanne	Chemist.
,, Delessert (Edward)	Member of the Photographic Society.
,, Duboscq	Optician.
,, Girard (Aimé)	Conservateur des Collections de Chimie à l'Ecole Polytechnique.
,, Hulot	Directeur de la fabrication des Timbres-poste a la Monnaie.
,, Mailand	Member of the Photographic Society.
,, Niepce de Saint Victor	Chef d'escadron, Commandant Militaire du Louvre.
,, Robert	Chef des Travaux de Peinture à la Manufacture Impériale de Sèvres. Professeur de Photographie à l'Ecole des Ponts et Chaussées.
,, Kely d'Oissel	Auditeurs au Conseil d'Etat.
,, De Villeneuve	*Secretaries.*

SUNDAY PHOTOGRAPHY.

Dear Sir,—Seeing in to-day's Photographic News that you would be glad to have the opinion of every respectable photographer respecting Sunday photographing, as regards touting photographic dens, I beg to offer a few remarks on the subject. The annihilation of these dens is a subject in which every respectable photographer is interested. Speaking from five years professional experience in photographic portraiture, more especially both in the Midland Counties and also in the West of England, it is my opinion, that the general public do not know good photographs when they see them, but are rather contented with pictures having the least possible resemblance to the parties whom they are meant to represent, which pictures, as if ashamed of their own ugliness, rapidly fade and disappear. Hence not unfrequently are respectable photographers asked by their customers, who have paid a fair and legitimate price, are you sure that this picture will stand and not fade? and been answered in the affirmative, say, because about two or three months ago I had a little portrait of myself taken by Mr. So-and-so for sixpence just to see how I looked, and the picture is all gone, and I have only the glass left, and I should be very sorry to give so much for a portrait, and for this one to go in the same way. Because bad photographs fade, the public very naturally think that good photographs, and those which are finished in a proper and skilful manner do the same, and dislike to lay out much money on that which they consider to be of doubtful permanence.

There is I think one way of ridding the country of these photographic dens, and the profession of men who would be a disgrace to the meanest mechanical calling; and thus removing from the art the stain of producing pictures which after a few months will fade.

The remedy I suggest is this: let a petition be got up respecting this Sunday-trading and unfair competition, and let every respectable professional photographer throughout the country sign it; let a licence be required for the practice of the art *professionally*, varying from £10 to £20 per annum, according to the size of the locality; we should then very soon find that the profession would be rid of those worthies who caricature you for sixpence. The art would assume a more respectable and dignified position, and first-class respectable photographers would be able to command better prices than they can now for their productions. I think it is evident from the conduct of Her Majesty's Commissioners in reference to photography at the coming Exhibition of 1862, although this has nothing to do with the matter in question, further than it shows that the public will not honour the art; and that what is done in reference to the matter of ridding the profession of these worthies must be done by photographers themselves.—I remain, dear sir, yours truly, T. S. Swatridge.

Princes' Street, Yeovil, August 24th, 1861.

Dictionary of Photography.*

Reflection.—When light falls upon any body a portion of it is thrown back from the surface or reflected, the remainder suffers absorption and reflection. All bodies reflect light, and it is only by the light they reflect that they become visible. The amount of light reflected by bodies depends on the nature of the surface, and the angle at which it is received. Every point in an object which receives light reflects it again in all directions, and thus renders the object visible, by some portion of this light entering the eye, from whatever point it may be viewed.

Direct light incident upon any plain polished surface is reflected from that surface at exactly the same angle at which it is received, the angle of incidence and reflection being always the same. A line drawn so as to strike a reflecting surface exactly at right angles is called a *normal*, and a ray of light striking the reflecting surface from such a direction as would form an angle of say forty-five with this normal, on the right hand, would be thrown off or reflected at just the same angle from the left side of the normal. The angle formed with the normal and the direct light is called the *angle of incidence*, and the angle formed with the normal and the light thrown off is called the *angle of reflection*.

This law of incidence and reflection appears at first sight only to apply to polished or mirror surfaces, which reflect light in the manner described, whilst irregular surfaces reflect it in every direction, the law really holds good, however, in all cases. Light is reflected in all directions from bodies possessing irregular surfaces, simply because these surfaces receive it, from their irregular form, at all angles, and thus throw it off at all corresponding angles. The bulk of the light, moreover, thrown off by bodies, and by which all their details of form and texture are rendered visible, is diffused or reflected light. If objects were only illuminated by the direct light of the sun without the aid of reflection, the contours only of anything would be visible and such of their details as were next the source of light; all the rest being total blackness or darkness. It is only in bright sunshine, however, that objects are illuminated by its direct light; the clouds, the atmosphere, every object upon which light falls, becomes a source of reflected or diffused light, and renders objects visible in their entirety of form and detail.

Reflecting mirrors, or prisms, were at one time, when daguerreotypes were taken, much used for the purpose of obtaining a direct or non-reversed image in the camera. By the law of reflection, which we have stated, it will be evident that a mirror placed with its reflecting surface at a suitable angle with the lens would give a non-reversed image in the camera. This practice is now, however, abandoned, as the negative obtained in a reversed position gives correct images by reversing them again in printing; and in glass positives non-reversed images may be obtained where it is desired by other means.

Reflected Lights, or Reflexes.—Those lights in a picture derived from any other than the direct or principal source of light, are called reflexes or reflected lights, and form one of the most important elements in the truth and beauty of chiaroscuro of a picture, whilst they are the chief agents in giving the effects of roundness, relief, and texture. The appearance on every object is materially modified by the character and position of the objects by which it is surrounded, and which reflect light upon it in degrees, affected by their colour, surface, and position. To the artistic photographer no subject of study can be more important than the native value of reflected lights. Perhaps nothing has contributed so largely to the worthlessness of many composition photographs than the entire inattention to this point. In a group of figures as actually placed, the effect of each is materially modified by the reflexes from each other. In the composition picture produced from a number of parts taken at separate times under varying conditions of direct light, and entire absence of all the conditions of reflected lights true to the subject, the truth of nature is altogether violated, and the result cannot fail to be unsatisfactory even to those least able to define the cause to which the manifest defect is due. We strongly commend the study of the value of reflected lights to the artistic photographer.

* Continued from p. 390.

Photographic Notes and Queries.

Blisters in Albumenized Paper.

Sir,—Your last contained an enquiry by "T. P. E." respecting some difficulties with a sample of albumenized paper.

Perhaps, in the absence of any other explanation, the following may be found a reasonable solution of the difficulty.

The paper has in all probability been salted with chloride of sodium, sufficient care has not been taken to amalgamate the salt with the albumen, or from some other cause crystals of salt have remained in suspension in the albumen. Now these crystals containing a certain amount of moisture, on the application of the silver bath to the surface of the paper, the albumen layer above these crystals swell, and, where the salt may be in excess, ultimately break, exuding their moisture—which, combining with the silver in larger quantities than in other parts of the paper, cause the stains—which are, in fact, darkened chloride of silver.

Should this suggestion prove correct, the paper is, of course, valueless for obtaining good proofs; it might, however, be worth while to dry a few pieces carefully by exposing the back of the paper only to the fire, and then floating them for a very short time on a tolerably strong silver bath; but there could never be anything like certainty of obtaining clean proofs.

Should you consider this suggestion a reasonable one, you can use it in any way you may think proper.—I am, sir, yours respectfully, E. E. L.

P.S.—It may be a question worth consideration if blisters do not, in most cases, arise from particles of matter imprisoned between the albumen and the surface of the paper. If we gum or paste a proof on a mounting-board, and the surfaces are not completely in contact, those parts where the adhesion is imperfect on receiving a wash of colour or moisture of any kind, will rise up and form blisters; those blisters generally subside on the proof drying, but in some cases will not do so. I think, sir, such cases are analogous to the blistering of the albumen film, and that we need seek no cause in the chemistry of the process.

[The suggestion of our correspondent regarding the blisters in the paper mentioned last week, is probably correct. The stains resemble blackened chloride of silver free from combination with organic matter.—Ed.]

Talk in the Studio.

The "Elephantinon" Process.—This is the name given —for what earthly reason we cannot conceive—to a very effective method of colouring, or rather of treating coloured photographs, whereby they are made more nearly to resemble ivory miniatures than anything else we have seen. The photograph, tinted in water colours, undergoes the process, and at once acquires the softness, delicacy, and transparency of ivory. The process is, we understand, the subject of a patent, and, as may be ascertained from an advertisement in another page, is taught and practised by Madame Una Howard.

Photography *v.* Biography.—The *Athenæum* in a somewhat ungenial notice of a recently published biography of John Brown, whom American abolitionists regard as the protomartyr of the "irrepressible conflict" or great anti-slavery struggle, remarks, "The present volume is adorned, more or less, by a photograph of John Brown, which, after all, offers the best apology for his character. Everything about it evinces a dogged unreasonable obstinacy, a determination to be a martyr; in fact, the portrait gives a better idea of the hero of Harper's Ferry than the four hundred and fifty pages of the text."

"The King of the Gorillas."—We have recently inspected some stereoscopic and other photographs of the "King of the Gorillas," described so graphically in the work of M. De Chaillu, and which is now in the British Museum. It is just about to climb a tree, one branch of which is grasped by its gigantic outstretched arm, the head is turned, with open mouth and glaring defiant eye, on some assailant. Nothing could present a more striking idea of this hideous travestie of humanity which has recently excited so much attention, than the stereoscopic views before us. The repulsive head set right on to the immense chest, without any apparent intervention of neck, suggesting the "men whose heads do grow beneath their shoulders;" the cavernous angry eyes—the enormously long and powerful arms—the large unwieldy paunch—and dark shaggy covering—the whole so like, and yet so fearfully unlike, man—are all, in the different stereoscopic views, brought before us with quite as near an approach to life-like effect as one desires to see. They are published by Birnstingl and Co., the firm who secured the contract for photography in connexion with the International Exhibition.

Photography in New Orleans.—A correspondent, writing from Houston, Texas, requests us to intimate to Mr. Anderson, photographer, of New Orleans, that a letter awaits him in the care of Mr. Atkinson, Manchester Street, Liverpool. The blockade of the port of Galveston cuts off direct postal communication, and Mr. Stanley, of Houston, has adopted this as the best method of forwarding a letter. Regarding the interruption of postal communication, he says:—"Of the Photographic News I have received nothing since the early part of May. Possibly you may have heard that all postal communication between the Southern and the Northern States has terminated, and that you have ceased to forward my copy. When the British Post-Office Department forward mails to Southern Confederate States, I will thank you to continue my supply. Of the missing numbers, if any, I will give you a list, and the extra charge shall be liquidated in my next remittance. Requesting that you will oblige me in this (for a famine in English photographic news does not suit an English rapacious reader), and apologizing for troubling you,—I am, sir, &c."

M. Claudet and M. Silvy.—In M. Claudet's recent letter to the *Photographic Journal* respecting the classification of photography in the forthcoming International Exhibition, he has some pertinent remarks on M. Silvy's letter claiming for photography a purely mechanical character. He remarks:—"A photographer, who has the pretension to be an artist, has thought to distinguish himself by calling his art an entire mechanical work. I think very few photographers will be converted to his opinion, and accept as easily, and without protest, the undignified place offered by the Royal Commissioners which he is so anxious for. The same photographer has asked this very funny question:—*Would the constructors of locomotives have the right to enter the engines for the Derby in order to compete with thoroughbred horses?* He might, with the same propriety, have asked, why asses should not have also the right to compete with both; for photography has its asses as well as its horses and its engines. But let us not complicate the question; is not the comparison very strange coming from a photographer? Its defect is, that it signifies nothing, and is not in the least to the point. For my part, I object to be compared to a horse as strongly as to be compared to an engine. The horse runs in proportion to his bodily agility and vigour, and his spirit is excited by the spurs of its rider; but I do not think that the horse who has run the fastest has proved to have elicited more genius, more mind, than those he has left behind in the course. Both the horse and the engine may indeed be classified among the machines; and at all events the horse will not enter his protest. When the race is over, he will be more sensitive to a feed of oats than to the praises and admiration of those who have witnessed his velocity on the racecourse. Let us hope that in photographic aspiration there may be something more æsthetic than a *picotin d'avoine*."

To Correspondents.

G. Lewis.—So far as our own experience goes we should recommend No. 2 on your list.

W. W.—It is difficult to say with certainty either the cause or cure of blisters in albumenized paper. It generally happens with a very highly albumenized paper, and more commonly with a *Rive* paper, or an English paper, than with a *Saxe* paper. Alkaline solutions have a greater tendency to cause it than those which are acid or neutral. It has been suggested that it was caused by the partial solution of the size of the paper at the points where the blisters occur, thus separating the albumen from the paper. It has also been suggested that as it only occurs in very highly albumenized papers, and papers which from their own hardness support a thick layer of albumen on the surface, and not at all permeating the fibre of the paper, it arises from the albumen not being coagulated through the whole of its substance, but only on the surface; this being the case portions of the under surface, not coagulated, become dissolved, and thus cause blisters of coagulated albumen to rise from the surface of the paper. In many cases these blisters subside in drying and form no defect. Where they are so serious as to deface the print the only plan is to use another sample of paper.

Beta.—The silver bath, whether used for exciting collodion plates, or sensitizing paper becomes gradually weaker, as it is robbed of silver in greater proportion than of water. It is quite true each plate or each sheet carries away with it a certain quantity of solution, but it also takes in the form of iodide of silver, or chloride of silver, a certain quantity of silver, the water belonging to which is left behind. Keep replenishing your bath for collodion plates with a solution of about 45 grains to the ounce, and your paper bath from a stock solution of about 80 grains or 100 grains to the ounce, and test it now and then with the hydrometer to ascertain the strength. 2. There is no necessity to take the trouble to add an extra amount of iodide, afterwards to be filtered out, in making a new bath: leaving a large plate coated with collodion for a few hours in a moderate sized bath will generally be found sufficient. If the bath be a large one the process may be repeated again, using another plate. 3. If you develop with iron you may correct the bath with nitric acid, but be careful and do not add too much.

An Old Reader.—Unless you are familiar with the processes of working with leather and blocking it into forms, you will find black cotton velvet a much more manageable material for the extending body of your copying camera. If you prefer the skiver it must be lined with black calico, or it would soon be torn. Proceed to make the bellows-body as follows:—Cut the leather the right size, and paste the black calico to it to form the lining. Whilst wet double it into folds about an inch and a quarter broad, turning each alternate way. Now take the long strip of folds formed, and bend it together at the places where the corners will be formed, and then turn over a corner so as to form a fold of the shape of a right-angled triangle at each corner. If the leather be well pressed into these folds whilst wet, it will readily, when dry and opened out, be made into the bellows extending body, the folds merely requiring a little adjustment to make them assume the proper position.

Deposit.—We are very familiar with the deposit to which you refer. It occurs more frequently when intensifying iron negatives before fixing, than when the intensifying is done after fixing, and is most generally met with in hot weather. There are two or three methods of dealing with it. The first and simplest is to use citric acid in the pyrogallic acid intensifying solution; this, if the acid be in sufficient quantity, will frequently prevent it. Another method which we have generally found to be successful is, after washing away the iron solution thoroughly, to pour over the plate a solution of iodine, made by adding alcoholic tincture of iodine to water in sufficient quantity to make it a deep yellow tint, or to use an aqueous solution of iodine altogether, 1 grain iodine, 1 grain iodide of potassium, to an ounce of water. After covering the plate with the iodine solution, hold it for a second or two to daylight; then wash and intensify. We have never met with a deposit after this treatment. In cases where a slight copper coloured deposit has occurred on the shadows notwithstanding every care, it may sometimes be removed by stopping the intensifying at once; and in fixing, pour the cyanide solution repeatedly over the part. Or should this method either fail or appear too dangerous, the effect of the deposit in printing may be almost entirely neutralized by pouring over the plate after fixing and washing, a dilute solution of bi-chloride of mercury, not for the purpose of intensifying, but for changing the colour of this foggy deposit from brown to white, which will then scarcely interfere at all with printing,

An Operative Chemist.—We cannot advise you as to the particular branch of photography best suited for the employment of your leisure hours, as that must depend so much on a great variety of circumstances: your own tastes and abilities, and the openings to which you have access must guide your decision. A lightish grey is the best colour for a background for collodion positives. A 40-grain silver bath is strong enough for either positives or negatives; a greater strength only increases the difficulties of working cleanly. About 130° Fah. we should call a low temperature for the manufacture of pyroxyline Many articles on the negative process have appeared in our pages, which you may read with advantage. Read the article on "Iron Negatives" in the present number, and the articles which will follow on the same subject.

Binocular and some other correspondents next week.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 157.—*September* 6, 1861.

IRON NEGATIVES AND BRILLIANT PRINTS.

The Nitrate Bath.

Having last week considered the conditions so far as they relate to collodion, upon which the production of brilliant printing iron negatives depends, we next have to deal with the nitrate bath; which we shall do very briefly.

A primary condition in a good nitrate bath for iron negatives is simplicity. With a good sample of nitrate of silver, a bath may sometimes be made thirty-five grains to the ounce, which will work satisfactorily immediately it is made and saturated with iodide of silver. As this is not always the case, we will briefly describe the mode of operation we generally pursue with success. We dissolve two ounces of the purest recrystallized nitrate of silver we can procure, in twenty-five ounces of distilled water, and filter into the bath. Then coat a large plate with the collodion we use, and leave it in the bath for half an hour or an hour; after which we try a plate. If it work well and give clean shadows, we submit it to no further treatment. If, as is frequently the case, there are streaks all over, and a deposit on the shadows, we try the bath with test paper. If it be neutral, as with a good sample of silver it is often found to be, one drop of dilute nitric acid—one part nitric acid 1·420 to three of water—is added, and another plate tried. This operation is repeated until clean shadows and freedom from streaks is produced. This result is generally secured by the addition of few drops of the dilute acid. Should more than this be required, or should the bath on testing be found to have a decidedly acid reaction and still produce fogged shadows, we look for the cause in something beyond the want of sufficient acid to prevent spontaneous or over-rapid reduction. Some trace of organic matter is probably present in the sample of silver or in the distilled water. The bath is at once rendered alkaline with oxide of silver. We do not find it necessary to use this freshly precipitated, but keep a small quantity in a bottle of distilled water. When required for use, it is shaken up and a few drops of the turbid solution is added to the bath. The whole is well agitated together and then exposed for a few hours to sunlight. A slight black precipitate generally ensues; the solution is filtered, again treated with nitric acid, and except under unusual circumstances all then goes well.

Much has been said at times about the advantages of a neutral bath, and there can be no doubt that theoretically it is favourable to rapidity. In practice, however, it is rarely found to possess much value, as it involves the necessity, to ensure clean results, of old collodion containing free iodine and a considerable amount of acid in the developer. Where iron is used, the presence of a slight amount of acid in the bath is absolutely necessary for satisfactory working. The exact amount is, as we have said, best ascertained by actual experiment. Sufficient to produce a slight reddening of blue litmus paper will not, if other things are in suitable condition, cause any sensible diminution of rapidity; but the safest rule is to use as little as it is possible to have, and yet obtain clean shadows.

We decidedly prefer the use of nitric acid with iron development to acetic acid. There are many reasons, theoretical and practical, for this choice. Where a pyrogallic acid developer is used, the presence of an organic acid, and even an organic salt of silver in the bath is a decided advantage. But with iron development the harmonious relation of bath and developer are best preserved by the use of the inorganic acid, whilst the full value of a bromide is best attained under the same circumstances. The practical advantages wil be very apparent if it be borne in mind that we are endeavouring to preserve the bath in as simple a state as possible.

Acetic acid once admitted into a bath is most difficult to eliminate. If it be necessary at any time to neutralize the solution, acetate of silver is at once formed, which we desired to avoid. Nitric acid on the other hand, either added too freely, or liberated by the continued use of a collodion containing much free iodine is easily neutralized, and the bath placed in its normal condition. It is important to possess this power, as it sometimes happens that under certain conditions a bath rapidly deteriorates. We were informed by one of our first photographers the other day that the collodion he was using would spoil a good bath in one day's operations with 12 by 10 plates. Whilst an exposure of twenty seconds gave good results in the morning, an exposure of eighty seconds was necessary to the production of equal results in the afternoon, without any sensible change in the quality of the light.

So far as we could judge from the symptoms, the liberation of nitric acid in the bath by a collodion possessing free iodine was the cause. With a bath containing nothing but nitric acid this might easily be remedied, but if acetic acid were present the whole case would become more complicated. Since, then, there are decided practical conveniences obtained, and since, with a bromo-iodized collodion and iron development the results are equal or superior in rapidity and quality of image when nitric acid, in place of an organic acid is used, we give the decided preference for every reason to the former.

Where pyrogallic acid is used for development, and especially with certain kinds of collodion, the presence of acetate of silver in the bath may frequently be found advantageous, and tend to the production of brilliant negatives. Where it can be avoided, we do not like it in a bath when iron development is used. It unquestionably aids in obtaining that density, which it is sometimes difficult to attain with iron. It has frequently, however, a slight tendency to interfere with sensitiveness, and occasionally with cleanness. It is quite possible, by a careful selection of the collodion, to obtain sufficient intensity, especially by the aid of after processes, with iron development in a bath prepared as we have described, pure and simple. The bath is then at all times easy to deal with, and the negatives have generally a delicacy not easily attainable, where organic salts of silver are present in the bath.

We recently stated the results of some experiments with the addition of free iodine to the nitrate bath as suggested by the Abbé Laborde. The object proposed—the production of unveiled shadows in a neutral bath—was so desirable where iron development was used, that we considered it worth a little effort to prove it satisfactorily. We have made a few further experiments with precisely similar results to those stated. In the hands of one or two friends skilled in such manipulations, the same conclusion has followed careful experiment. Free iodine added to a neutral solution of nitrate of silver, whether already saturated with iodide of silver or otherwise, has simply combined with the silver and liberated nitric acid. There is nothing, therefore, we fear to hope from that suggestion.

There are cases in which, from the presence of some unknown impurity—some sulphur compound of silver has been suggested—every effort to make a bath work cleanly and rapidly is unavailing. Insensitiveness and fogging characterize the bath, which is quite new, or has been worked but a day or two. And there are a variety of other difficulties with the bath, which occur in the course of use. But we are not dealing with the general question of the derangements the bath is incident to, but rather pointing out those conditions most desirable to secure for the production of thin, but brilliant iron negatives. This, in our own practice, and in that of some of our most operators, is found in the bath we have described, and which we commend to those of our readers who practice iron development.

Next week we shall have something to say as regards the operation of light and development in this process.

NEW APPLICATION OF PYROXYLINE.

A novel and somewhat singular application of pyroxyline is described in the specification of a patent recently obtained by Mr. S. Barnwell and Mr. A. Rollason, for "Improvements in Combining and Mixing certain Solutions of Pyroxyline with Animal, Mineral, and Vegetable Substances, by which its quality is altered in such Manner, as to produce Hard, Resistant, Adhesive, Plastic, or Resilliant Compounds and Articles unalterable in their Nature, and varied in Colour, which said Compounds in a State of Solution may also be advantageously employed as Paints or Varnish."

As a method of utilising the waste acids accumulating in the manufacture of pyroxyline is proposed, it may prove interesting to many of our readers; and we shall make sufficient extracts from the specification to explain the purpose and *modus operandi* involved in the patent.

It will naturally occur at the outset to the minds of all who have experimented at all in making pyroxyline, that it is a somewhat expensive material to use for manufacturing purposes in the place of gutta percha, vulcanite, &c.—for it is in the place of such substances we presume it is to be used—but we glean that not only may the waste acids from the manufacture of photographic pyroxyline be used, but that these may be used over and over again. The specification states:—

"With reference to the pyroxyline itself, and its manufacture, which has hitherto been effected by a difficult, uncertain, and expensive process arising from the fact that the mixed acids, nitric and sulphuric, used in converting the fibre into pyroxyline could not be employed more than twice in the same operation, as they would be found to hold either a considerable quantity of pyroxyline or converted fibre in suspension, or that the nitrogen was partially exhausted, or from both these evils together; consequently, after twice using, these acids were of no further service for such a purpose. With the view, therefore, of utilising these waste acids we employ as our fibre, and in place of cotton wool (which we can employ, although we prefer the following) common rags of any description, plain or coloured, and having submitted them to the action of the acids in the same manner as cotton, we find that they do not become disintegrated as the cotton would, and consequently after twenty or twenty-four hours' contact with the acids, the acids may be drawn off free from any suspended pyroxyline.

"The partially exhausted acids are then put in suitable air-tight vessels, until a sufficient quantity may have been reserved. The bulk is then to be thoroughly and evenly mixed and boiled, then analysed, and the loss of strength ascertained; after which, the equivalent must be supplied by the introduction of very strong fresh acids in the requisite proportions, by which they will be restored to their original strength, when they may be re-used. This re-use and renewal may be repeated as often as may be found desirable. This is the description of pyroxyline we prefer to employ in our subsequent processes of manufacturing compounds of pyroxyline into various useful articles, though any description of pyroxyline will also answer these ends; but, as before stated, at greater cost.

"We also obtain a very useful description of the same article by submitting fibrous and others matters containing celluloso to the action of mixed acids of such modified strength and temperature that they will be only partly converted into pyroxyline, and, consequently, they will be only partly soluble in the solvents of pyroxyline; this forms a kind of half-stuff. But in all cases both the pyroxyline and the partially converted fibre or half-stuff must be freed from acids and dried before advancing to the further processes."

Regarding the purposes to which the pyroxyline thus produced is to be applied, we learn that:

"The invention consists in dissolving pyroxyline in any of its known solvents, and adding thereto oils, animal vegetable, or mineral, varying in their nature and their action, with pyroxyline, selecting any of these to suit any particular views we may entertain relative to the subsequent use of the compound. To this we add, if desirable, gums or resins, and also oxidisable salts, such as oxide of manganese or oxide of copper as colouring agents. Any other suitable colouring may likewise be employed. Other mineral substances, such as chloride of calcium and iodide of cadmium, are useful when articles of an uninflammable nature are to be produced. Animal matters in the shape of glue, gelatine, or wool flock, or of nature similar to these, we also find useful for the purpose of strengthening the compound. The material resulting from these combinations is applicable to the manufacture of many solid, hollow, or tubular articles that have hitherto been made of glass, china, metal, wood, india-rubber, and such like materials, and the treatment of the compound for the purpose of making such articles would vary with the nature of the article to be produced; for instance, buttons may be made either by stamping them from a solid sheet of the new material after the manner of horn button making, or they may be shaped in moulds whilst the material is in a plastic or semi-fluid state. So with drinking cups, bowls, and flasks, which may be made by coating either the inside or outside of glass or polished metal moulds with repeated layers of the new compound in a state of solution, or by the mode by which pressed glass is made; the material being used in a plastic state, in which state also it would be found very useful for employment in moulding or taking fine casts, such as those required for purposes of dentistry and modelling for jewellers, goldsmiths, and other industries needing sharp, smooth, and undestructible models or moulds. It may also be employed for making tubes and instruments for surgical and hygienic uses. Cups, bowls, tubes, and such like things may also be made by coating textile fabrics with our solution, and then cutting such fabric out into the desired shape, and afterwards cementing the edges; or the raw material of such textile fabrics may be saturated with our solution, and from which various articles may be produced.

"In the solid form in sheets it would be useful for bookbinders and fancy box makers, for making collapsible tubes for colours, and for all the purposes for which collapsible tubes are used; and as it can be rendered adhesive by some of the modifications already mentioned in the manufacture, its applications in this form would be multifarious.

"In a state of solution its uses would be as a vehicle for pigments, either oil or water, or as varnish for pictures, painting, prints, or papers, a lacquer or wash for gilded or plated wares, whether on wood or metal, to protect them from injury; as a coating for hat bodies, for boots, shoes, and leather in general; lining or covering plastic casts, pens, telegraph wire, and all delicate parts of machinery requiring protection."

In addition to these proposed contributions to the arts of peace, we find that this form of pyroxyline is once more to become literally *gun*-cotton, and assist in producing, instead of attempting to supersede, gunpowder:—

"In the manufacture of gunpowder we find pyroxyline extremely useful, and this forms one of the most important applications of our invention. We take dry pyroxyline, and reduce it to powder, in which state we employ it in place of or in conjunction with charcoal in the manufacture of a gunpowder. This, from the highly explosive character of the material, adds very much to the strength of the gunpowder, whilst it avoids, to a very considerable extent, if not altogether, the residuum that remains after the discharge of ordinary gunpowder, and at the same time is free from the danger attending the use of gun cotton."

The name of the purposes to which this new preparation of pyroxyline is literally legion, and seems to include every possible or imaginable article to which a plastic material can be applied. We shall conclude by extracting just one paragraph out of several, enumerating its uses:—

"Articles of apparel of every kind, umbrellas, parasols, cart covers, tents, sails, machine bands, straps, belts, tubes, harness, for bookbinders' uses both as a cement, and also as a material for the covers of books; air and water bed and cushion covers; sponge and other bags; cups, bowls, basins, and jugs; to protect cartridges, caps, and projectiles from damp; for bottles, boxes, and jars; for surgical and dentistical purposes, as well as for the manufacture of sticking plaister and surgical instruments, and for any other purpose analogous to or of a kindred nature to any of these; in a pulverized state as a substitute for charcoal in the manufacture of gunpowder. In the state of varnish or lacquer it may be used for wood, papier-maché, leather, metal, bricks, stone, plaster, glass, china, earthenware, bone, ivory, india-rubber, gutta-percha, gelatine, and all other articles made of or similar to these, or of a nature akin to these. For rendering impervious to the action of the atmosphere all articles desired to be preserved; for finishing and stiffening every description of paper and pasteboard; as a varnish for oil and water-colour paintings, and a vehicle for pigments; for sheathing for ships, and roofing; for saturating articles or goods requiring it; and, generally, for any and all purposes of a like nature to those we have already enumerated."

ACCIDENTS WHICH OCCUR IN ENDEAVOURING TO OBTAIN MAXIMUM SENSIBILITY.*

BY M. MC. A. GAUDIN.

After substituting a porcelain dish for the one of gutta-percha, and preparing a bath of solution of fused nitrate of silver slightly accidulated with nitric acid, I succeeded in obtaining negatives in the tenth of a second with a compound stereoscopic lens, with a diaphragm of $1\frac{1}{2}$ inch, but I still had some little spots caused by crystals. Supposing these latter had fallen upon the collodion film, I sensitized the plate with the collodion, side downwards on the bath, but the spots and holes continued to appear, nevertheless.

I again thought of adding some acetate of lead, hoping by this to provide a remedy for the annoyance; but none happening to be in my laboratory at the moment, I added to my bath, with the same object in view, a few drops of acetic acid, thinking to obtain thereby at the most an almost instantaneous diminution of sensibility, and at all events the same degree of purity in the proofs. But it was not so; the bath completely ceased yielding pictures, not from extreme slowness, but from a complete fogging. I attributed this extraordinary result to a reducing substance present in the acetic acid, to *acetone*, which may probably produce this effect.

Fortunately, I had modified only one half of my bath, the other portion having also yielded me negatives spotted with holes in the same manner as the first, I added a trace of *nitric* acid to it instead of acetic acid, expecting to find a retarding effect as the result, but still very clean pictures; but, to my great surprise, the result was exactly the same as when I added acetic acid, it was not possible to obtain the slightest trace of an image. These facts appear to me very extraordinary: I have mentioned them to some experienced photographers, who tell me they have observed the same effects. I must confess, however, that I did not take into account the possible impurity of my nitrate, which, prepared from a button of metallic silver in the crucible, contained iron, zinc, cadmium, &c., but I do not think this was the cause of failure.

Having thus rendered my bath insensible, I wished to restore it by the moist way. I precipitated the silver by carbonate of soda, and redissolved it with nitric acid. Upon experiencing some difficulty in saturating this new bath with iodide, I precipitated a large quantity in the silver solution, and after agitating it for some time, carefully filtered it. I was certain of having obtained this saturation; nevertheless, the layer of iodide upon the sensitized plate was quite imperceptible, and cut by a transparent horizontal line (where the iodide of silver was deficient), at the height of the level of the bath, when the sensitized plate, collodion side downwards, was raised vertically to drain.

This time the negatives were of remarkable purity, but it took fifty times longer exposure to obtain them. I was certainly well aware that my bath was weak in silver, but I did not think that this thin layer of iodide and the slowness of impression was due solely to the weakness of the bath; but upon washing the last proof, after having fixed it, the stream of water detached the image without removing the collodion, affording a certain proof that the bath had become exceedingly feeble, perhaps reduced to 2 or 3 per cent.

Thus, when the silver bath is exceedingly feeble, not only is the layer of iodide detached, as is well known, but it is not wholly formed, and the sensitiveness is reduced in an extraordinary degree in consequence of iodized collodion still remaining under the layer of iodide of silver formed on the surface; for in my last experiment I had not a fourth of the opacity proper to the collodion I employed, and which I obtain immediately when making use of a strong silver solution. From this, I conclude, that, in all probability, the sensitiveness is in proportion to the strength of the nitrate bath, and that probably a bath of the strength of twenty-five per cent. would yield such advantages in this particular as to cause it to be preferred in taking portraits The examination of this question I shall undertake in my next essay.—*La Lumière.*

* Continued from p. 401.

Scientific Gossip.

When photography was in its infancy it was not a difficult matter to get chemicals free from adulteration. The demand for them for photographic purposes was so small that it was not worth while for any one to take the pains to palm off an inferior article as pure to get merely a trifling profit. Now, however, things are different. Tons weight of substances are consumed at present, where pounds were formerly used, and adulteration, the great commercial curse of the present day, revels in the photographer's laboratory. Amongst the other chemicals which have greatly deteriorated of late years is hyposulphite of soda; the difficulty of detecting any of the salts of other sulphur acids being a great temptation to an unprincipled manufacturer to send the article out incompletely purified, or even largely adulterated with other salts. Of these sulphur acids the most injurious is sulphurous acid, which in the form of sulphite of soda, is a very common as well as a very injurious contamination. Up to a very recent period there was no test for its presence in hyposulphite of soda which could be easily applied by an amateur, but within a few weeks a very excellent reagent has been made known, by means of which we have ascertained the presence of sulphite of soda in several samples of commercial hyposulphite, of which complaints had been made by photographers as to their imperfect fixing properties, and liability to stain the prints. The test is founded upon the reaction which takes place between nitroprusside of sodium and sulphite of soda. When solutions of these two bodies are added together there is produced a pale rose colour which is much more distinct when an excess of sulphate of zinc has been previously added to the solution of nitroprusside; but an intense purple red is produced when a small quantity of yellow prussiate of potash is added to the mixture. This reaction may be applied to the detection of sulphurous acid in hyposulphite of soda or other bodies in the following way:—If the salt to be tested is not neutral it is first neutralised with acetic acid or bicarbonate of soda; an excess of the latter is not objectionable, but an excess of either caustic or carbonate of soda, or of carbonate of ammonia prevents the reaction. If any bases are present which give insoluble salts with sulphurous acid, such as silver, these must be removed. Then a proportionately large quantity of solution of sulphate of zinc is mixed with a very small quantity of nitroprusside of sodium, and added to the solution to be tested. When the amount of sulphurous acid present is not too small, a rose red, or dark red colour is soon produced; but if it is not very distinct the addition of some yellow prussiate of potash will give an intense red. In this way a most minute trace of sulphurous acid may be detected. Hyposulphite of soda or hyposulphurous acid under the same circumstances produce no reaction.

The action of a beam of light upon a mixture of chlorine and hydrogen gases was lately very beautifully shown by Dr. Frankland. He produced the mixed gases, in a darkened room, by means of the electrolysis of hydrochloric acid. The gaseous mixture was then passed into a small collodion balloon. Two parabolic reflectors were then arranged one over the other, the lower one being placed face upwards, and having in its focus the charcoal points of an electric lamp; by this means the light was sent vertically upwards in the form of a solid cylinder of rays against the upper reflector, upon which they were received and reflected downwards again to a focus, being concentrated to a point some five or six inches below the level of the upper cylinder. The hydrogen gas which was mixed with the chlorine in the balloon, was sufficient to give the whole a slight ascending power in the atmosphere. The balloon was then allowed to rise to the proper position below the upper reflector, when the concentrated beam of electric light fell upon the mixed gases and caused them to explode instantly with a violent detonation. That the effect was not due to heat was shown by the collodion envelope being unconsumed after the explosion, the torn shreds falling on to the floor. This experiment shows that light is to chlorine, to a certain extent, what heat is to oxygen.

A new process for preparing nitrate of silver has been recently published in several periodicals. It consists in dissolving impure silver in nitric acid, and when the liquid is almost neutral and cold adding a solution of sulphate of soda to precipitate the sulphate of silver, which is to be washed in distilled water; after this, digest it with the aid of heat in an equivalent proportion of nitrate of baryta, thus forming sulphate of baryta, which may be separated by filtration, and leaving nitrate of silver in solution which can then be crystallized. This is by no means a difficult process, but we do not think it would answer well in practice. The product could scarcely be pure. The facility with which nitrate of silver combines with alkaline nitrates, makes it likely that it would have a certain affinity for nitrate of baryta.

The specification of a very trivial photographic patent has just been published. The patentee, Mr. Mills, has not, however, proceeded with it; owing, no doubt, to the extreme want of originality which it displays. In order to give a more natural appearance to the sky of opaque. stereoscopic slides, which usually appear white, or nearly so, the inventor cuts away such portions of the pictures as represent sky, going very carefully up to the outline of the objects represented in the pictures. Then in viewing stereoscopic slides thus manufactured, he employs a stereoscope with an open or transparent stage, and allows light to pass through this stage, as is usual in viewing transparent stereoscopic slides. This light he colours by causing it to pass through a coloured medium, and in this manner he obtains, or supposes he obtains, the appearance of a transparent sky, either blue or of other tints which may be desired.

Examinations of glass for photographic purposes in the spectroscope are still being asked by our correspondents. Several have been received since we last reported on this subject. Below we give the results of our trial experiments.

18. T. W. S.—This specimen of glass is of a brown colour when viewed by transmitted light, and becoming much darker, when it is placed upon white paper. It is not coloured on the surface only, but is a body colour throughout. Tested in the spectroscope by diffused daylight, it was seen to cut off almost completely the blue, indigo and violet rays above the fixed line F. When, however, the instrument was directed to the sunlight considerable quantities of these rays, especially near the line F, were seen to be transmitted. This glass would therefore afford no security if the collodion were one containing bromine, and scarcely any if a pure iodised collodion were used. Two thicknesses of this glass would be nearly safe if sunlight were not allowed to shine on it, but the operations must not be conducted very near the window.

19. J. S. R.—A saffron coloured glass. This is almost identical in tint with the one described as No. 2. S, at p. 349, No. 151; if anything, a trifle darker. It would be no more efficacious than the one there mentioned.

20. F. N.—A dark red glass. This is very decided in its action on the rays of the spectrum. Most of the yellow, and all of the green, blue, indigo, violet, and higher rays are cut off very perfectly, even when the strong light of the sun is used. The transmitted light is almost pure red, being only fringed at the upper extremity with a narrow orange band, and is entirely without injurious action, whatever be the preparation of collodion which is sensitised behind it. The only objection is the great amount of luminous rays which it cuts off, which being without action on the sensitive plate, might just as well enter the photographer's room for the benefit of his eyes. This glass is similar in its properties to No. 9, p. 349, and like it is rather painful to the eyes after long examination owing to the green hue which it causes everything to be tinted with. This, however, is an objection which might disappear when the eyes become more accustomed to its employment.

A specimen of yellow oiled silk, and a few more pieces of glass which have been received too late for examination this week, will be reported upon in our next article.

SOME NOTES ON POSITIVE PRINTING.*

BY SAMUEL FRY.

From the preparation of paper and printing I come in turn to toning, which is often one of the most puzzling matters to an amateur or tyro, and even to a large number of professional photographers. I presume all now adopt what is known as alkaline toning, although the preparation should really be neutral or as nearly so as can be managed. Where this is the case, it will be found that over printing is scarcely necessary, or under most circumstances to a very slight degree, and this will be found to save much valuable time, as the excessive over printing required for very alkaline toning nearly doubles the time in the printing-frame. Where quantity is an object this may be of importance. But in addition to this, I am inclined to think that from a neutral solution may be obtained a larger variety of good tones than from the alkaline. Prints should certainly be toned as speedily as possible after removal from the frame, for during warm weather especially, the surface soon becomes horny, and difficult of penetration by fluids, as will be found by the length of time required to dissolve out the free nitrate of silver; this latter I generally expedite by a bath of weak salt and water after a few minutes in luke warm common water, by this method the whole of the silver is at once converted into chloride. Many photographers are careless about cutting the black edges of paper from their prints before toning; if this be not done, a serious loss of gold is involved. It is generally estimated that a grain of gold should tone a sheet of paper, but to make it do this it is essential that these edges be cut off, or the gold will scarcely tone half its quantity, this intense black of the outer part becoming toned almost instantly, whilst the print itself loses the gold thus consumed. The time required for the tone to be acquired must naturally vary with the strength of the silver bath, the character of the paper, and the temperature of the solution. With a silver bath of 60 or 65 grains, Rive paper, and the gold bath at a temperature of 65° Fahrenheit, if the gold be in the proportion of 1 grain to half a pint of water, a very few minutes will suffice to give the prints a fine colour. I differ from those who recommend a small number of prints only to be immersed at a time. W[illegible]

* Continued from p. 412.

this is done, there is danger of the first few absorbing too rapidly a large quantity of gold and becoming blue. I prefer to take a dry dish, and having the prints close at hand, in a vessel of luke warm water, place a print face uppermost on the bottom of the dish, and pour over back and front just sufficient gold solution to cover it, repeat this with all the batch, stopping occasionally to turn them over, by this means all patchiness of colour is avoided, each print has its proper quantity of gold, and a uniform tint will pervade the whole batch. By regulating the time of immersion almost any colour may be obtained, but the utmost care is needed to avoid too long an exposure to the influence of the gold, or the whites become degraded, and the whole tone of the picture needlessly lowered, a cold heavy gray taking the place of rich warm vigorous tones.

As the one great object sought in all the pains bestowed on our prints is to obtain rich, powerful pictures, reproducing as nearly as paper can do, all the vigour of the negative, our labours would be ill bestowed if, by any oversight in the final processes, the prints lost their beauty nevertheless it is a complaint of daily occurrence that this is the case; one obvious cause of loss of vigour and tone in the hypo is ommission of a thorough washing after toning and before fixing, if this be properly carried out, there will rarely be found the loss alluded to. The most potent cause of poor tones, mealiness, and weakness, is an insufficient strength of silver-bath. Every grain of silver has its part to play, not only during the actual exposure to daylight, under the negative, but in the producing every tone and shade, and during the colouration and fixing. I recommend a quarter of an hour in the fixing bath of new hypo, 4 ozs. to a pint of water, at the expiration of this time, the prints should exhibit perfect purity of white, and by transmitted light should be so transparent as to leave the fine fibre of the paper unclogged by opaque matter. Before immersion in any vessel of water to remove the hypo, each print should be placed on a sheet of glass, and well washed under a considerable force of water, which may be thus applied without fear of abrading the surface—this being done, if circumstances allow they should be all placed before going into the tanks in lukewarm water for half an hour, this having more effect in removing the hypo than a much longer period of cold water, and if properly toned and fixed, no apprehension need be entertained of losing the tones already acquired. Three or four hours after this in running water will be ample to remove all traces of hypo as may be easily ascertained by a test always at hand; thus, after hanging a print to drain until the drops fall very slowly, allow one drop to fall on to a piece of sensitized paper which is peculiarly sensitive to the presence of hypo, the smallest trace is sufficient to produce a brown stain; if none be present the prints may fairly be assumed to have had sufficient washing.

"CARTE DE VISITE" PORTRAITS.*

One of the most pleasing forms of photographic portraiture is the *Carte de Visite*. Fashion may have much to do with the great demand for this kind of picture, yet its inherent attractions together with its cheapness are sufficient to account for its great popularity.

The usual size of the cards upon which these portraits are mounted, is 4 by 2½ inches, the pictures being about a quarter of an inch smaller each way.

The distinguishing characteristic of these portraits is their including a full length. The position may be sitting or standing, but the feet must be introduced. This constitutes the charm of the picture, for the photograph is no longer a fragmentary representation of a half or three-quarter length, or the mere head, but comprises a complete portrait of the whole person. Thus a skilful artist may in these pictures produce more truthful likenesses by rendering accurately not only the features but also the proportions and form of the figure, together with many of those peculiarities of dress and deportment that constitute the idiosyncrasy of the individual. Great scope is also afforded for the introduction of appropriate accessories, drapery and backgrounds, so as to form not only accurate likenesses, but also pleasing pictures.

The position may be either sitting or standing, the latter being most usually selected as better displaying the form and proportion of the individual. It is here the true artist will shine in the selection of such arrangements and disposition as accords with the character of his sitter. No rules can be laid down but such as good taste and the exigencies of the moment, or the peculiarities of the individual, may suggest.

The primary object should be to produce a characteristic likeness, and the secondary one to render it as pleasing as possible by a judicious selection of the view of the face and *pose* of the figure, so as, without sacrificing character, to bring out the good points and conceal the less favourable ones. Much more scope is afforded in these "cards" than in the usual photographic portrait. In the latter, the main attention is concentrated on the head, the rest of the portrait being kept quiet and in repose. These small full-lengths allow more latitude, and should represent the person with something of the freedom and action of every-day life. Some photographers have but two or three positions in which to place their sitters; this, though bad enough in ordinary portraiture, is execrable in card pictures, where the object should be to introduce as much freedom and variety as possible. As no two persons are alike, so no two should be posed the same, and the accessories should be differently arranged in each case.

These little pictures permit the introduction of many graceful additions, which materially enhance pictorial effect. Drapery, balustrades, columns, pedestals, vases, handsome chairs and tables, footstools, couches, all find their appropriate places when arranged by the hand of taste. Painted backgrounds may be judiciously used, but they require care in their management to avoid theatrical effects and noisy display. They should always be quiet, retiring, and unobtrusive, and be in complete harmony with the portrait. Unless they are so used they had much better be abandoned, for by the use of other accessories they can always be dispensed with. Even in the use of these accessories considerable moderation is required not to bring too forward these subordinate parts of the picture. Nothing can be more unpleasing than to see a portrait of a person surrounded with a crowd of incongruous objects, and it becomes almost painful to see the same things monotonously repeated in the portraits of a number of friends.

As these portraits are so small it is important that the definition be very perfect. The quarter-plate lens with which they are generally attempted to be taken, is rarely equal to the task, the reason being that their fields have too much curvature, and the definition is seldom sufficiently good on the edges of the field. Hence many a lens that takes a good quarter-plate sitting picture where the head is near the centre of the plate, fails to give a well-defined card-portrait where the head and feet are placed at the edges of the field. This roundness of field is often advantageous in ordinary sitting pictures; but in the small full-lengths it is objectionable. It is very annoying in focussing on the hands to find the head and feet indistinct, and, on turning the lens to make the latter sharp, to find the former all blurred.

A lens, though possessing a curved field, if it give good definition on the edge of the field, may, by the use of Waterhouse diaphragms, be fitted for taking these pictures by employing a stop that causes the head, feet, and hands to be in focus at the same time. If a lens, however, does not give good definition on the edge of the field, no stops will enable it to take these portraits well, and the only remedy is to obtain a better lens. Taking a visiting-card

* From the new edition of "The Principles and Practice of Photography," by C. Jabez Hughes, noticed in another column.

taxes a lens much more than taking an ordinary quarter-plate portrait.

When the glass room is long enough, a half-plate lens is the proper one to use, and much less distortion, more natural proportion, and more equable definition will then be obtained. Lenses are now being made expressly for this kind of picture, the focal length not being much longer than the quarter-plate, but giving flatter fields, so that head, hands and feet, may be all sharp at once, without requiring a small stop.

In taking these pictures it is important that the lens and camera should be kept horizontal, and pointed nearly opposite the centre of the figure. Unless this be attended to, especially with short focus lenses, the individual will be represented as if standing on an inclined plane, instead of a solid floor; the lower part of the legs and feet will also be considerably distorted and out of focus.

These pictures require a special arrangement of light. They will bear a little stronger distribution of light and shadow than ordinary photographs, for as all the features are so small, it is important they be well marked. Sufficient diffused light must, however, be used to soften the shadows and prevent the pictures being hard in outline and black and white in tone.

The collodion used should be such that gives transparent shadows; the bath should be slightly acid, and the developer should have sufficient acid to keep the deep shadows free from deposit. All the chemicals, in fact, should be in such condition as to give clear, clean, and brilliant negatives.

It is usual to employ a camera with two or four lenses mounted on it, and thus to take two or four pictures with one exposure, and by means of a repeating movement in the dark side of the camera, double the number may be taken on one plate.

In all other respects, the production of these pictures is the same as the usual photographs, except, that as they are so much improved by the final rolling process, that operation should never be omitted.

Critical Notices.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY FULLY EXPLAINED, &c. By C. Jabez Hughes. Second Edition. London: published by the Author.

We noticed the first issue of this excellent little manual only a very few months since, and are happy to find that the demand has been so large as to require a second edition already. This circumstance has enabled the author to give a new value to his work by the addition of several extra chapters on subjects of great current interest. Amongst these are "Intensifying Processes," "Instantaneous Photography," "Improved Gold-Toning Process," and "Carté de Visité Portraits," the latter of which we have, by the author's permission, transferred to our columns in the present number. We once more cordially commend this as one of the most valuable instruction books for beginners, and reference books for advanced operators.

ECCLESIASTICAL ANTIQUITIES. A Series of Stereographs. Hereford Cathedral. By W. H. Warner.

The series of stereographs before us will be a treat to the ecclesialogist, and all interested in the architectural memorials of antiquity which abound in our cathedrals, the home study of which is strikingly aided by photography and the stereoscope. It has often been observed that the stereoscope enables a man to become an extensive traveller without leaving his own village. It does more, it familiarizes him with by-gone ages, when with a scene like the present before him his mind reverts to the periods to which the views belong.

Here is the Library in Hereford Cathedral. The ponderous and precious tomes, quartos and folios of manuscript, are all safely secured by chains, being too rare and too valuable to remain loosely in their shelves, to the temptation of borrowing students. Insensibly the mind reverts to an ante-Caxtonic period, and glances into the black lettered and illuminated records. Still backward, the "Norman arches in the Choir" bring the retrospective mind to the period of the conqueror. Still continuing its backward flight, "The Font" brings the wanderer to a period full of interesting associations, the time of Saxon England. The tombs and monuments, of baronets and bishops; the varied styles of architecture indicating their varied periods, are all aids in the stereoscope—which so truly renders the exact texture of the time-worn stones as compared with that of the various restorations, with every other characteristic detail,—to archæological researches in the study, which might otherwise require the personal examinations and travel of years. Mr. Warner has entered upon the production of these slides, manifestly with an appreciative interest in the subjects he was pourtraying, which will give great value to the series. As photographs they possess considerable merit, and that merit is considerably enhanced in the eyes of a photographer when he remembers the difficulties involved in these dimly-lighted interiors. The negatives from which the slides before us were produced required exposure, as we glean from the written information at the back of each, varying from forty seconds to thirty minutes. They were all developed with iron, and with very few exceptions sufficient density obtained without further intensifying.

A series of large pictures of the same subjects was, we understand, produced, but these we have not seen. We can, however, cordially recommend these slides as giving a very perfect conception of the interior of one of the oldest of the fine old cathedrals of this country, and as pre-eminently valuable to the ecclesialogist.

STEREOGRAPHS OF THE ISLE OF WIGHT, AND INSTANTANEOUS SEA PICTURES. By R. James, Junr. Published at Ryde.

The Isle of Wight, as all who have visited it know, presents some of the most lovely subjects which can be conceived, for the stereoscope, and we have amongst Mr. James's slides, some of the best selected amongst these lovely views; but we also have, we are bound to add, some that are rather tame and commonplace. One of the first things the landscape photographer should learn, is to exercise the art of selection; and one of the next things he should learn, is to have the courage to destroy every negative which lacks pictorial merit. When a photographer exercises this self denial, and only issues such pictures as are really good, he necessarily rapidly acquires a reputation; but if he issue good and bad indiscriminately, simply because he possesses the negatives, he leaves it doubtful whether he is really capable of distinguishing the good from the bad of his own productions. We wish for the sake of the art, and for the sake of the photographers who thus publish indiscriminately, that a more rigid self criticism and self sacrifice were exercised before publishing. It would pay better in the end, as well as increase the reputation of all practising it. Amongst Mr. James's views, for instance, there are some very excellent, well selected subjects, and some capital photography; but there are, as we have said, some subjects which are tame and uninteresting, and some which are imperfect photography. Some with stopped out skies, which are thus spoiled both as pictures and stereographs. Mr James in a modest and intelligent letter which accompanies his pictures, tells us that the greater part are on dry plates, and that the skies are not sufficiently perfect to print without stopping out. Very good: don't print them at all. Those which are perfect are quite sufficient to gain Mr. James some reputation, which the others will only tend to destroy. We make these remarks in all kindness, because many of the pictures are highly creditable.

To some extent the same remarks will apply to Mr. James's instantaneous pictures. More rigid self-criticism and self-sacrifice should have been exercised before publishing. We have some charming views on the Solent of sun and cloud, sea and shipping. The general tendency is to slight under-exposure, to thinness in the negatives, and, in some cases, to a want of perfect instantaniety. Some of the pictures are very charming for all that; but some possess these faults in a degree sufficiently marked to destroy their other beauties; and these it would have been well to reject. The negatives we are informed, were chiefly obtained about the hours of four in the morning, with sun-rise effects, and eight in the evening during sunset. Some of these, although a little under-exposed, have great pictorial beauty. There is one slide, "Day-break on the Solent, from Ryde Pier, No. 338," a perfect gem of suggestive beauty and solemn grandeur. Darkness is on the face of the waters; the whole expanse of the sky covered by one huge dark cloud, through a rift in which gleams a faint streak of light, the source of which is as yet unseen, but this gleam is manifestly the harbinger of approaching day. The picture is full of poetry, and reminds one of what Danby or Martin would have loved to paint. Some other of the pictures of sea, cloud, and shipping, are very interesting, and not ill done. Mr. James has, in some instance, like Wilson, pointed his camera in the face of the rising or setting sun, a daring experiment, very fine in result when successful, but rarely securing sufficient success to justify the daring. Here, as in some of Wilson's, the sun is surrounded by an immense halo, manifestly due to some imperfection in the mounting of the lens, the tube of which causes this halo by its reflection. Where such an immense stream of effulgence is reflected in the water as that produced by the setting sun, it is imperative that the exposure be absolutely instantaneous, as the slightest movement in the water, destroys the exquisitely and strongly marked light and shadow on which the liquidity and transparency of the waves entirely depend. The manipulation in these pictures appears to be good, and the selection in most cases happy; the lenses we are disposed to think are the chief sources of defect, some imperfection in rapidity, in definition, and in mounting, being apparent. The series has nevertheless many very fine pictures, and the price is so low that anyone buying a score may easily pick out half a dozen which would be cheap at the price of the whole.

Mr. James has also forwarded us a very fine large picture of the interior of his glass room which shows a very choice selection and arrangement of accessories, and forms a fine picture. It is a good specimen of what may be effected by iron development.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 4th September, 1861.

Professor Gerlach, of the University of Erlangen, has obtained some photographs of microscopic objects by a new method, which consists in taking the object itself as the negative image, and then taking a magnified positive of this image, and repeating the operation, alternately positive and negative, until an image is obtained of such a size as to present details of structure for exceeding in magnitude those obtainable by the most powerful microscopes at present in use.

On the other hand, Herr Fierlander announces that he has succeeded in obtaining by the assistance of an Oberhauser's microscope, photo-microscopic negatives of the most delicate organs of plants, and magnifying under very satisfactory conditions of success these infinitessimal negatives, so as to obtain positives comparable to the best phyto-glytic engravings. Although his positives are extremely good, we do not perceive in them any degree of merit superior to that possessed the productions of many other photographers, still, however, we are always glad to welcome every effort in extending the applications of photography.

M. Gaudin, in a new communication on the accidents occurring in the endeavour to obtain maximum sensibility, shows how mysterious and delicate are the agencies concurring to the successful production of a negative picture by the materials now in use, and places in a most striking light that condition of things so expressively denoted by Sir John Herschel as "a state of tottering equilibrium." M. Gaudin intimates that it is not his intention to publish the formula of his collodion-photogene, but to manufacture it for sale. In these days of subtle chemical analysis, we can hardly encourage the idea that he will be able to maintain the secret of the composition of his new agent.

Professor Zantedeschi, of Padua, asserts his claim to prior invention of the *spectroscope*. He states, that in 1852, he instructed M. Porro, the eminent optician of Paris, to make a spectroscope after a model with which he (the Professor) supplied him, and which is described in a memoir he published under the title of "*De mutationibus quæ contingunt in spectre solari fixo*," which was also inserted in the 8th vol. of the Memoirs of the Royal Academy of Sciences at Munich, for 1857.

Professor Zantedeschi maintains that his spectroscope is superior to that invented by Kirchoff and Bunsen. By means of an object lens, the rays enter and depart parallel with the prism, and consequently the phenomena of interference is completely eliminated; by means of another eyepiece, the spectrum can be projected on a plane surface, and analysed by several persons simultaneously.

In a memoir presented on the 13th of May last, to the Royal and Imperial Institute of Science, Art and Literature of Venice, the Professor contributed a paper entitled "*Critical and historical remarks upon the luminous spectrum considered as a* photodoscope *or the most delicate analyser known to Science.*" On page 79 occurs the following:—

"In concluding this chapter, I must remark that the solar spectrum is actually the most correct *Photodoscope* that can be imagined. Light, so to speak, undertakes to describe and represent carefully all the changes which take place either in the nature of the luminous body itself, or in the medium through which the latter is compelled to traverse. On that account I think it useful to suggest to physicists the construction of a camera intended exclusively for *photodoscopic* observations. Such observations will certainly yield most interesting results, not only for meteorology, but also for the science of light and for astronomy. Light, which to our eyes seems intended to paint the face of nature, is capable also of depicting itself in displaying to us new marvels proceeding from the secrets of its own nature, and in making known to us the changes our planetary system undergoes." Also, on p. 59:—"These very delicate and most interesting phenomena are the best that science has supplied us with for comparing together the lights proceeding from different sources, and estimating their reciprocal action upon matter which we designate *heavy*."

A specimen of paper manufactured from wood has lately been introduced to the notice of photographers. It is of perfectly homogeneous texture, free from spots, knots, and other objectionable defects; it seems admirably adapted to copper-plate printing, and equal in every respect to *India-paper*. Its price, too, is moderate; in fact, half the cost of paper made from rags. As it consists of pure cellulose, I hope that it will be found available for photographic purposes.

M. Cari-Montrand, has turned to industrial account the scientific fact, long since enounced, of the decomposition, under the influence of an elevated temperature, of dry phosphate of lime mixed with carbon, by means of hydrochloric acid, as a means of manufacturing phosphorus on a large scale.

Calcined bones, reduced to a fine powder, are mixed with a quantity of pulverised wood-charcoal sufficient to convert all the oxygen of the tri-basic phosphate of lime into oxide of carbon. The mixture is placed in cylinders of refractory clay, glazed on the interior, and fills about three-fourths of their capacity. These cylinders are made red hot, and then a current of hydrochloric acid is passed in at one extremity.

Under these circumstances the phosphate of lime is immediately decomposed, and chloride of calcium, oxide of calcium, hydrogen and free phosphorus are formed. This latter is distilled, and by means of a copper tube dipping into a vessel of cold water, it is condensed together with some oxide of carbon, hydrogen, and the excess of the hydrochloric acid gas. The water of the refrigerating condenser becomes very acid by the absorption of the excess of the hydrochloric acid gas, and is employed to digest the calcined bones, which are dissolved, or at least, softened in it, by which the trouble of pulverising them is avoided. The magma resulting from this maceration is mixed with the carbon, and the whole evaporated to dryness, and completely dessicated before being introduced into the cylinders.

The hydrochloric acid is obtained by the decomposition of sea-salt by sulphuric acid, and the chloride of calcium which forms the residue in the cylinders may also be turned to account, for, treated by sulphuric acid, the hydrochloric acid is regenerated, and sulphate of lime is formed, which is useful as a manure. The chloride of calcium may also be decomposed by steam.

THE ART CLAIMS OF PHOTOGRAPHY.

"Audi alteram partem."

Sir,—The old and trite story of the two-sided shield seems to illustrate, not inaptly, the controversy which has recently arisen regarding the position photography is to occupy in the International Exhibition of next year. Photographers, or at least some of them, have accustomed themselves to look only on the golden side of the shield, and appear ready to do battle with all comers who shall declare that any particle—not to say a whole side—of baser metal enters into its composition.

To a looker-on like myself, associated with art, but not indifferent to a power, so nearly allied to art as photography, and having some practical knowledge of both, the controversy, the record of which in your pages I have read, has alternately amused and surprised me. If it be not altogether "flat blasphemy," to do so in a photographic paper, I should like to submit, very briefly, one or two considerations regarding the art claims of photography, which seem to have escaped the attention of those who demand for it an unqualified and unquestioned position amongst the fine arts.

Is photography properly an art or a science? I shall doubtless be answered that it is both; and, to a certain extent it doubtless is so. But is it not more properly the latter than the former? Does it not depend from first to last for the production of results upon a series of chemical reactions? What is the tyro in photography first recommended to study in order to attain certainty and excellence in his operations? He is told that he must at the outset gain some knowledge of chemistry. To what does he chiefly attribute his failures when they occur? His "chemicals" are out of order. What are the topics chiefly discussed at meetings of photographers? So far as I can glean they are chiefly "chemical conditions," "processes," "modes of manipulation," "powers of lenses," &c. Who are the men who chiefly take part in these discussions and appear to be leaders? Chiefly chemists and men of science. Who are the "professors" of photography in the only college where a faculty of photography exists? In King's College the late professor was an eminent chemist, and the present professor is, I understand, chiefly eminent as a mathematician, and a student of general science. Upon what does the professional photographer generally rely for success? Upon the purity of his chemicals, the perfection of his lenses, and upon, as you recently pointed out the phrase, his skill as an "operator."

I am not anxious, sir, to search far for these evidences of the essentially scientific character of photography. These evidences all lie on the very surface, and present themselves first to impartial observers. If I am not mistaken, this view of the matter was, until recently, that entertained by photographers themselves; and I think I remember to have seen quoted some remarks of a distinguished member of the photographic society's council, to the effect that he did not see what was wanted with "pictures" in connection with the *science* of photography.

But I shall be told that whilst photography is based upon science, and requires a strict regard to certain principles of chemistry in practice, yet in result it is essentially a fine art. "If," says one, "photography be merely a process consisting of a series of definite chemical manipulations, then the results would, *cæteris paribus*, be of equal value in each manipulator's hands." Another insists that "photography can embody pictorially all that is beautiful in nature or art; that everything of beauty the eye can see, photography can depict; and therefore it is a fine art." Another advocate exclaims that "photography is capable of expressing intention and design, and is therefore a fine art." The president of the Photographic Society in his first letter to Her Majesty's Commissioners, observes that it "gives room for the exercise of individual genius, so as to stamp a special character on the works of photographers, and give to the result of their labours the impress of the mind of each artist."

All these arguments may have some value; but they are not sufficient to prove that photography is a fine art. To the first argument that if photography were a mere process all its results would be the same, it is merely necessary to observe that there are differences in the amount of skill shown, and results produced, in the most mechanical arts. The crossing-sweeper observed that sweeping a plain pathway was simple enough, but to produce a neat curve or sweep round a corner, "that was fancy-work."

With all due deference to the second argument, I must affirm that the mere pictorial reproduction of the beautiful in nature and art, even if all affirmed were true, does not constitute a legitimate claim to a position in the Fine Arts. Photography has not yet attained the power of depicting all that is beautiful in the world of beauty; even some charms besides colour have as yet eluded its powers. But without depreciating its wondrous results, I must submit that they form no necessary claim to the position demanded. The reflected presentment of a fine landscape in a mirror, is as lovely a picture as can be conceived; not merely form is there, but colour in all its ever-changing beauty; golden sun-light and transparent purple shadow; and atmosphere with all its indescribable charms. All this is in the mirror, and the picture is matchless in truth and beauty. But is the mirror-maker an artist, or is silvering looking-glasses a fine art? Or would it be any more so if the power existed to fix, by some chemical process, these mirrored beauties? They are reflected there by the operation of one law of science, and they might possibly be fixed there by another. But there is a mighty difference in method and result between these, and the visions of beauty drank in from nature, and pondered and recombined by the conceptive brain of the artist, and reproduced on the glowing canvas by his trained hand following the impulses of that brain, and not working out a chemical process. Again, if the production or reproduction of pictorial results by mechanical means gave the respective methods employed, art claims, the workmen on the *Gobelin* tapestries, and the printers of chromo-lithographs would be artists. Having admitted these claims, stencillers and carpet weavers would surely point to their pictorial efforts; and where should we stop short of Berlin wool work and sampler embroidery? In all these, too, as well as in higher and lower branches of the mechanical arts, it is quite possible for the mind of the workman to impress itself upon his work, and give especial character to his results. Emphatically I exclaim that photography is not *per se* a Fine Art.

Thus far and briefly on the claims of the art. A few words now on the claims of the artists and their productions. Let me ask you, sir, is there one per cent. of those practising photography who have any claim what ever to the name artist? or who have had any art training or education? There are a few names I know, eminent amongst photographers, who also have had previous training and experience as artists; there are such men as Lake Price, and Rejlander, and Wilson, and Delamotte, and there may be others. But these are unquestionably the exception; not the rule. For the most part those claiming the name of "photographic artist" have left "the farm and the merchandise"—if I may include under this euphemism many less dignified callings—to take up the camera. Amongst these I willingly admit the existence of many men of eminently artistic capacity and taste; but these again are the exception, not the rule. Then as to the results of the art, how many libels on the "human face divine" has it not been guilty of! Fine art! Why photographic portraiture has been the very apotheosis of the common-place and vulgar!

And now I fancy some enthusiastic photographer ready to exclaim, "Why the fellow who can form his estimate of the capabilities of our glorious art by an examination of the specimen cases of twopence-halfpenny portrait shops, is unworthy of attention. Why does the fellow ignore the exquisite productions of Mudd and Bedford, Heath and Wilson, Rejlander and Williams! Why I wonder if the fellow ever saw a good photograph!" Fair and softly my extravagant young friend. I have a portfolio of photographs in which are specimens of the masters you have named and some others, and which I cherish amongst my art treasures. Nay more, I unhesitatingly admit, that I have seen many photographs perfect gems of art, and that photography in the hands of a true artist may often yield results worthy to be classed as works of fine art. But all this is due to the man, not to the method. The true artist will make himself felt no matter what the vehicle of expression. I have seen evidences of artistic skill in the drawings in coloured chalk on the pavement by a mendicant, and in the design scratched with a rusty nail on a pewter plate by a prisoner. But I should not call the processes by which these results were obtained fine arts. I do not use these comparisons in any derogatory or offensive sense; but I cannot but come to the conclusion that in the present state of photography the acknowledged chemical skill required, and attention to other scientific conditions is absolutely a clog upon the artist. I have heard photographers exclaim as they examined some glorious conception of an art-photographer, with a purpose and intention suggestive of beauty in every line, "What a pity he is not a better photographer?" The art was good but the photography was imperfect. And yet the men who would pooh pooh such pictures, will claim for photography the rank of a Fine Art!

I have purposely avoided any remarks on the fact that photography must be literal. It cannot, except in a limited sense, select; it cannot combine; it cannot modify; it cannot idealize; it cannot imagine; it cannot create. Whatever comes within the range of the lens, beauty and ugliness alike, all are uncompromisingly depicted. It is not always true, or even near truth; but commits some most contradictory blunders. Yellow, the colour which on the palette is most allied to light, it represents by darkness. Blue, which the painter regards as most allied to shade, it renders by its nearest approach to light. I am willing, for the present, however, to bate these considerations.

If I have not entirely exhausted your patience, I should like to add one or two remarks on the position assumed by the Photographic Society towards Her Majesty's Commissioners.

In the classification first issued, photography, probably from some scarcely considered following of the catalogue of 1851, appeared in the mechanical department. When the attention of the Commissioners was called to the matter, they at once expressed their wish to do all honour to the art-science, and stated their willingness to give it a room to itself, where the photography of the world might be displayed. What more desirable concession could be hoped for I cannot conceive. The Commissioners do more: they ask the Society to appoint a committee to co-operate with them, and by that act at once intimate a desire to make such arrangements as may be most palateable to photographers, and just to their art. But no; the old proverb must be illustrated: *Quos Deus vult perdere dementat prius.* The Society, already tottering to its fall, might have gained new strength and life from an active alliance with the great international undertaking, declines the chance. Her Majesty's Commissioners are an insignificant and unimportant body: the Society is a big and powerful body, and it must dictate terms. The Commissioners must eat humble-pie, and, publicly, at the bidding of the Photographic Society, confess to a blunder. It shows a fine knowledge of human nature, and we know the result.

To complete the joke, and at least keep it consistent in all its parts, the society recommend photographers generally to abstain from exhibiting. Here is a chance for them to show there productions to how many hundreds of thousands of persons, shall I say—may I not say millions?—from all parts of the world; and on some fancied construction as to dignity—which no man in his senses can conceive to be an intentional slight on the part of the Royal Commissioners to an art practised by royalty or a society patronized by royalty—they are to refrain from such a chance of publicity! This is another fine example of the knowledge of human nature, and we shall see the result.

Apologising for this long intrusion into your columns, which without pleading the force of the motto which heads my letter I could not have dared to attempt.—I am, sir, your obedient servant, R. A.

[Admitting the force of the motto named, we insert the communication of our correspondent. Next week we shall probably have a few remarks to make on the subject.—ED.]

"ANSWERS TO CORRESPONDENTS."

SIR,—Recently in a photographic contemporary uncomplimentary doubts were expressed as to the genuineness of this interesting and valuable portion of photographic journals. The person who wrote the remarks must either have a very limited circle of dull correspondents who never desire information or very self-satisfied ones, who need ask no questions. For my own part, I remember the time when I used to rush eagerly to this column to get some new "dodge," some fresh "wrinkle," some stray hint, and which was oftener of far more value to me than the heavy optical papers crammed with hieroglyphics, or dry-as-dust chemical ones, bristling with symbols and formulæ which occupied the bulk of the journal. At that period I read my journals, as Jews read Hebrew, backwards, beginning at the last page. I am not certain that I have quite discontinued the practice yet. I am sorry, therefore, that anything should be said likely to throw doubt on this desirable portion of photographic journalism. Because a man, residing in an obscure, out-of-the-way place, have few persons passing his door, is he to deny the existence of crowded thoroughfares? and, if Mr. Briefless have no cases, are Serjeant Bluebag's all myth's? Suppose a man live in the Hebrides, can he expect as many correspondents as by residing in Cheapside? The Scilly Islands are not remarkable for their amount of postal communications. When a man gets a correspondent, a good deal depends on how he answers him, whether he or his friend apply again. In former days I wrote many times for information, and frequently received useful hints, for which I was very thankful at the time, and have experienced a lively remembrance of ever since. I'll admit I did not write to Shetland or Kamschatka. If a photographic journal had existed in Nova Zembla or Patagonia, I think I should have preferred sending my communications to London.

Having, therefore, availed myself of the information of editors in their "answers to correspondents," I do not care to have my corporeality doubted, and my existence denied. My mythical character will be assumed soon enough, but not for a good few years yet I hope. Neither do I like gentlemen's veracity to be impeached for kindly answering my inquiries. I fully believe your answers are all genuine, for many of the questions, from their inherent foolishness, could certainly not emanate from your own brain, and the rest would naturally come from sensible readers.

I do not think that a person is bound to sign his own name when he asks for information. When John Smith asks why his collodion film peels off his plate on drying, or Henry Brown what he is to do with his bath that he has dropped a bit of hypo into. what does it matter how these persons sign thsmselves? When I once wrote I subscribed myself a "Photo in a Fix," and so I was. Another time I was "In a Fog," and the worst of the matter. it was true. With the "Correspondents," therefore, I have great sympathy. "A fellow feeling makes us wondrous kind." It is bad enough for a poor fellow to have to confess his troubles; pray don't compel him to publicly give his real name and address too.

But my idea of this "Answers to Correspondents" column is, that it should contain nothing but such that is interesting to the body of the readers. No portion should contain answers to private or uninteresting letters; and the replies should be so stated as to be instructive not only to the individual correspondent, but to the subscribers generally. I especially object to having to buy and pay for answers to letters that I don't know the meaning of. A. B. may be informed that "the process you allude to is a very good one;" but why should not I as well as he know what process is described as "a very good one." Y. Z. is told, "your lens is too long in the focus;" what is it too long in the focus for I want to know? This sort of answer is tantalising, and is, moreover, unjust to the great bulk of the readers. Why should one, two, or more lines be inserted which is interesting only to one reader. The plan you adopt in the News is a great improvement, where you either state the question, or so word the answer that the same information is made useful to all your readers. I dare say correspondents often ask foolish and irrelevant questions; but editors should not punish their readers by inserting equally uninteresting and irrelevant replies. Some of the answers read as mysterious as the second column of the *Times* advertisements. I sometimes read, "Yes, we have our eye on the individual. and shall catch him when he least expects it." Am I to understand by this and similar replies that there is a corps of photographic detectives going about seeking whom they may devour? I object strongly to this inuendo and semi-confidential style. Whispering in company is notoriously bad manners; but whispering in print must be a breach of all etiquette. If the letters are not worth an intelligent reply, let them remain unanswered; but don't make this column a "poste restante" for everybody who writes to the Editor.

Interesting as it is now, I am certain that well managed "Answers to Correspondents," might be made one of the most useful features of your paper, for the question made by one, has doubtless been *thought* by a hundred, so in answering the one, you do the same to ninety-nine others, as well as informing many more to whom the question may not have occured at all.—Yours, A Live Correspondent.

[The remarks in a contemporary,—who was, we fancy, joking—as to correspondents generally being myths, amused us. It sometimes taxes our ingenuity to supply satisfactory answers to all the questions we are asked—ranging, with every gradation, between the manufacture of telescopes and the mending of mangles—without perplexing our brain with the invention of difficulties. It is our aim always in answering one correspondent, to make the information intelligible and useful to many.—Ed.]

Dictionary of Photography.*

Refraction.—So long as a ray of light passes through a transparent medium of the same degree of density, it proceeds in a straight line without any deviation. But the moment the density of the medium is changed, the ray of light, entering at any angle but a right angle, is bent or turned aside a little in its course, or, in other words, it suffers refraction. If it enter the new medium perpendicularly it continues the same straight course, but if it enter at the slightest angle refraction ensues. A very simple and familiar example illustrates this. If a stick be plunged into water obliquely it appears to be bent at the point of contact with the water. The amount and direction of the refraction is determined by the variation in the respective densities of the mediums through which the ray of light passes. When the ray of light passes from a rarer into a denser medium, as from the atmosphere into water, its direction is bent towards a line passing perpendicularly through that medium; and when it passes from a denser medium into one more rarefied, it suffers deviation in a direction from a similar perpendicular. As a ray entering a piece of glass from the atmosphere would be refracted towards the perpendicular, so it would, of course, on leaving the glass and passing into the atmosphere again, be refracted from the perpenicular, resuming the direction it had before entering the glass.

The angle formed by the incident ray at the point of incideuce with the perpendicular, is called the *angle of incidence;* and the angle formed with the perpendicular by the same ray, after being bent, is called the *angle of refraction*, and the sines of the angles of incidence and refraction are always in the same ratio.

It is in virtue of this law of refraction that lenses can be made to refract light in any desired direction, Since light in passing from the atmosphere into glass is always refracted or bent towards a line perpendicular to the surface at the point of incidence, by varying the form of the surface, the direction in which the light shall be bent or refracted can be determined and regulated.

Various transparent bodies have different refractive powers, generally dependent on their density, but is also much regulated by their chemical character, all inflammable bodies refracting light much more than non-inflammable bodies.

Reproduction.—A term used by the French, and from them coming much into use amongst English photographers, intended to indicate what is sometimes technically called copying. A reproduction is a copy from another picture, whether the original be photograph, painting, or engraving.

Resins.—Vegetable substances obtained from the exudations from various plants and trees, which are generally discharged in a fluid form, and subsequently become concrete. They are frequently at first combined with some volatile or essential oil, and are then known as *balsams*, a common example of which, considerably used in different departments of photography, is the balsam of fir, or Canada balsam. Resins are of various colours. generally more or less transparent. somewhat brittle, having a smooth conchoidal fraction. They melt with heat, and are mostly inflammable, burning with a dense flame, and emitting a more or less aromatic odour.

They are insoluble in water, but either entirely or partially soluble in essential oils, ether, alcohol, and the various hydrocarbons. Some acids, strong alkaline solutions, and fixed oils, have also the property of dissolving many resins.

Fossil resins, such as amber, are supposed to be the remains of antidiluvian plants. Gum resins, such as myrrh and aloes, are natural combinations of gums and resins, and are partially soluble, both in water and alcohol.

Resins are chiefly valuable to the photographer from their

* Continued from p. 417.

use in varnishes, and are valuable in proportions as they are transparent, hard, and tough, free at once from tackiness and pliability. Those chiefly used are lac, amber, sandarach, copal, animi, benzoin, dammar, and mastic. Some of these are wholly, and others partially, soluble in alcohol, essential oils and camphor being frequently added to assist their solubility. Those least soluble in alcohol are generally entirely soluble in chloroform or benzole. Those soluble in alcohol form varnishes, which generally require the aid of heat to enable them to dry bright and transparent; whilst those soluble in chloroform and benzole dry without the aid of heat, without showing any tendency to "bloom" or "chill." Amongst those used with the latter solvents are amber and dammar, and sometimes animi and copal. The resins chiefly used in spirit varnishes are lac and sandarach. The layer of resin left by spirit varnishes is generally less tacky, and less friable than that given by other varnishes, and is therefore most used for protecting negatives.

Common resin, or colophony, is not sufficiently hard for varnish purposes, but has been suggested for use in photography, as an addition to collodion for the preparation of dry plates.

Resin Process, The.—The use of resin in collodion for dry plates was originally proposed by the Abbé Despratz, and adopted since with various modifications, and in many cases with considerable success, by various experimentalists. Several resins have been tried, but that most usually adopted has been the product of the pine or fir-tree, either in the form of Canada balsam, or common colophony. The proportions used have varied largely, but those best suited to the production of good results appear to vary in different hands, from one-fourth of a grain to a grain per ounce. The supposed operation of the resin is to prevent the complete closing or contraction of the pores of the collodion in dessication. The plates are excited in a 40-grain nitrate bath slightly acid, and, after thorough washing, are dried without the application of any preservative preparation whatever. For the purpose of ensuring the entire absence of all free nitrate, the plates may, after washing in distilled water, be placed in a bath of salt and water, and then again well washed; or they may be washed well with common water, containing chlorides, &c. The exposure is said to be about half that usually required by a Fothergill plate. The development may be effected either by means of protosulphate of iron, or by pyrogallic acid. It is urged by many who practise this process as a point of great importance both as regards the shortness of the exposure necessary, and as regards brilliancy of result, that the plate be immersed in the nitrate bath for about one minute previous to the application of the developer. It is a point of importance to add, as regards the nitrate bath, that it should be acidified with acetic acid, and contain no trace whatever of nitric acid. About three or four minims of glacial acetic acid to each ounce of silver solution has been found to give good results. The chief difficulties to be anticipated are generally fog and blackening of the plate. This is caused by an unsuitable condition of the nitrate bath, probably from the presence of free nitric acid. Insensitive spots; these proceed from the presence of too large a proportion of resin. Splitting of the film, &c.; this is caused by the use of damp or dirty glasses, and by the collodion being too contractile. Want of density; this is chiefly caused by the use of an unsuitable collodion. To obtain the best results it is necessary to use a collodion giving a dense image when used wet, and without too large a proportion of bromide. It has been suggested by some experimentalists that as the best results are generally produced by the smallest proportion of resin, one-fourth of a grain being the amount recommended by some of the most successful practisers of the process, the results would probably be just the same, under similar conditions, if no resin at all were used; and that the introduction of a body insoluble in water, and inert on nitrate of silver, would simply be without operation in small quantities, and injurious in large proportions. A careful comparison of the operation of the same collodion under the same conditions, with and without the addition of resin, would be interesting in relation to this subject.

Photographic Notes and Queries.

Stereo-Exchange Club.

Sir,—In recent numbers of the News I have noticed propositions from two correspondents for altering the rules of the Stereo-Exchange Club. Either plan would, I think, if adopted, be a great improvement on the present system. As a proof that some change is needed, I enclose prints received in exchange for two of average merit. They were accompanied by an apology, certainly; but the amount of apology that could render such rubbish worth mounting would just about equal the impudence that could send them.

Of the two, "Stereo's" plan appears to me the most practical, and likely to be carried out to the satisfaction of members, most of whom, if I mistake not, would not desire to receive "similar subjects" to those they send, but would look upon the club as a means of varying their collections. Little onus would rest upon any good photographer who should undertake to class prints merely according to their merit as photographs; but he would sometimes find it difficult to satisfy members as to the value of the subjects he had selected for them, whilst, if this was left to themselves, they would have no room for complaint.

It only requires that some one should take the initiative in one way or other. If yourself, or any one you should name, would kindly undertake to act as secretary and publish the rules by which you would be guided in the News, I believe you would receive stereograms from as many photographers as would reorganise the club at once, and you would at the same time confer a great benefit on the contributors.—I am yours, &c., Binocular.

[A recent correspondent, whom we know to be well qualified for the duties, volunteered to undertake the duties of secretary under the arrangement he proposed. We only wait for more general assurance, on the part of members, that the new plan would be acceptable, in order at once to take steps to put it into practice.—Ed.]

Albumenizing Paper on Both Sides.

Sir,—Will you allow me to suggest the use of paper albumenized on both sides for printing positives; by this treatment the curling of the paper, a great annoyance, is entirely done away with, and the whole of the process made much more pleasant.

From experiment, I believe that greater permanence will be obtained, the paper should be of a close texture, and well albumenized on both sides, the sensitizing bath not less than 90 grains silver to the ounce; the paper to be immersed in it for one minute *not floated*. Photographs printed on this paper may be used for book illustration as there is no necessity for mounting them, which has been a great drawback to their use for this purpose, and prints mounted for portfolios, &c. are not half so curled up as may be frequently seen if the mount be thin. I remain, yours respectfully, R. Harmer.

The Spoon Plate-Holder.

Dear Sir,—In the description of my plate-holder in the News of last week two typographical errors occur, which I should not have troubled you to notice, were it not that one of them renders my meaning somewhat obscure. In the first place for *ribbet* read *rabbet*, next, for *drain* read *drum*. I may perhaps be allowed to add that to use this Plate-holder to the greatest advantage it should, after exposure, be applied to the glass plate as it lies in the dark slide on the removal of the lid. It will then safely lift the glass from the slide, and hold it securely through all the subsequent operations. I remain, yours truly, M. A.

To Gelatinise Plates.

Sir,—I pour the gelatine prepared as Major Russell directs, and pour it into a flat dish. I then affix the plate-holder to the back of the plate, and place the front gently on the solution. You thus get easily a very equal and regular covering of gelatine with the greatest ease. I have a Flavel's kitchen range, and I place a piece of blotting paper on the range, and allow the gelatinised surface to be towards the warm iron sides of the range. The draining is absorbed by the blotting paper, and the plates dry with the most satisfactory result, and many can be completed in a very short space of time. T. F.

Talk in the Studio.

The Photographic News Office.—Our readers have had a very narrow escape of being deprived of this week's Photographic News. An immense and alarming fire commencing in London House Yard, and extending into Paternoster Row, devastating a large amount of property, occurred the night before we went to press. The buildings immediately opposite our office were entirely destroyed; and as the Row is but a very few yards across, the flames repeatedly caught our windows, being only prevented from obtaining entire hold of the building by the continued efforts of the firemen. At the earlier stages of the fire, the wind being from the south, the flames rapidly travelled in our direction, and had no change occurred in the wind, nothing could have saved our own office and other buildings in the north side of the Row. Happily the wind changed in time, and we suffered little damage save cracked glass and some scorched "copy." The large tallow warehouse so long a nuisance in this spot long sacred to literature, is entirely destroyed, and happily will not be rebuilt.

Light, Heat, and Electricity.—Late investigations have shown that light, heat, and electricity, are convertible one into the other; that each may be measured by either of the others, or by the force of gravity. The mechanical value of the heat required to raise 1 lb. of water 1° is 772 foot lbs. Thus, light might be made to drive a clock!

Water Barometer.—Mr. Glaisher communicates to the *Times* an interesting account of the removal, under his superintendence, of the Water Barometer of the Royal Society from their apartments at Somerset House, to the Crystal Palace, where it is now erected and in operation. "The instrument is in an angle of the Tropical department, and near the great tree. The top of the column of water can be seen from the first gallery, and, as that which causes a variation of an inch of mercury, will cause a variation of more than a foot in the column of water, so the change in the latter will be more than twelve times as great as that in the former. Many oscillations, therefore, may be seen by the water which cannot be seen by the mercurial barometer; and in gales of wind or heavy storms, it will be highly interesting to watch its action.

Napthalizing Gas.—Our readers will remember that we described some time ago the great increase in both the illuminating and actinic power of the light from coal gas when the gas had passed through the vapour of naptha. We see it is stated that M. Leveque, of Paris, France, has invented a new apparatus for carburetting or naphthalizing gas. By its peculiar construction, the hydro-carbon liquid is kept at a constant height in the apparatus We understand also that a company has recently been formed in this country for the purpose of commercially utilizing the valuable qualities thus conferred on gas.

Novel Application of Photography.—In a report of a Committee of the House of Lords recently issued, upon the manner of fulfilling the conditions of the Turner bequest to the nation, there are some interesting remarks on the preservation of pictures. In referring to the influence of gas, it is stated that in order to observe accurately whether there was any increase in the number or extent of the cracks in valuable pictures, photographs of these cracks had been taken, thus preserving an unerring record of their condition in this respect at a given date.

Phenomena and Laws of Light.—Messrs. Elliott, Brothers, are now manufacturing an apparatus for illustrating the phenomena of the diffraction and interference of light. This is attained by the assistance of photography. Transparent apertures in an opaque collodion film are produced on glass, and a point of light is viewed through the apertures. The forms of the apertures are exceedingly various—triangles, squares, circles, ellipsis, parabolas, hyperbolas, and combinations of them, besides many figures of fanciful forms, are included in the present set. When an image of the sun is viewed through these apertures, figures of extraordinary beauty both of form and colour, are produced; and of each of these many variations may be obtained by placing the eye-glass of the telescope at distances from the object glass. Many of the figures produced, especially when the telescope is out of focus, might suggest very useful hints to those concerned in designing patterns. Although the phenomena are chiefly of interest to the student of science, in consequence of their bearing on theories of light, yet their beauty and variety render them amusing to all.

To Correspondents.

Clericus.—The brown mottled effect in your prints is the result of imperfect fixation. The strength of hypo you use, one ounce in six of water, is scarcely strong enough to begin with, and will soon get exhausted; hyposulphite of silver will be formed, but the solution will not be strong enough to dissolve it. The hyposulphite of silver decomposes, and causes the brown mottled spots of which you complain. The reason why it occurs sometimes and not always, is because the conditions are not always present. Thick, hard, highly albumenized paper will be more likely to bring about the result than thin absorbent paper. The sheets sticking together in the hypo will aid in producing it, and, of course, the solution being overcharged with the salts of silver from use. Make your hypo stronger, one ounce in four of water, and be careful to avoid the causes we have indicated.

James J. Maginn.—Various methods of taking several pictures on one plate with one lens, have recently been proposed. Your method seems to answer very well, and we shall be glad to receive the particulars. We should recommend you to think twice, however, and ascertain what has been done in that direction, before you go to the expence of procuring a patent.

H. Larriston.—See answer to Clericus. It is very important in fixing a number of prints together to keep them moving whilst they are in the hypo, and prevent them sticking together. Five minutes are scarcely sufficient time for fixation. Ten minutes or a quarter of an hour would be better. 2. Over-exposure would not necessarily render a negative slow in printing, unless it were over-developed as well. Read the article on "Iron Negatives" in our last. The negatives there described print most rapidly.

J. G. L.—The toning formula best suited to the production of good results with iron negatives is that in which acetate of soda is added to the chloride of gold; see "Notes of Positive Printing," by Mr. Fry, in the present number. We hope to have the experience of one or two other skillful photographers in this direction shortly. 2. A warm solution of common washing soda, and final rinsing, will render oil flasks chemically clean.

William Weston, Minor.—Powder colours for positives are prepared in various ways by different manufacturers, but they require skill and practice in such matters to succeed. Try grinding them very carefully with a little Canada balsam. 2. We do not know any photographic purpose, to which you can, with advantage, and without much expense, put a non-achromatic lens of six feet focus. 3. An amalgam of tin and quicksilver is used for silvering looking glasses; but we cannot direct you as to the method of proceeding; we do not imagine you will succeed as an amateur. 4 & 5. We cannot give you any practical information as to transferring lithographs to glass, or painting magic lantern slides. 6. The interiors of coal pits and stone quarries might possibly be taken by means of Moule's Photogen.

A. Miller.—We cannot recommend the collodion of any special maker. Any good bromo-iodized collodion is suitable for iron development. See our article on "Iron Negatives" last week. 2. There are enamelled iron plates for positives, which may be had of most of the London dealers.

E. P.—Bromide of ammonium is to be had ready prepared of all photographic chemists. The maker No. 2 we prefer. Instantaneous pictures are most frequently produced by stereoscopic lenses, but larger instantaneous pictures may be produced by quick-acting large lenses.

X. X.—You are using too much alcohol in your developer, a drachm to the ounce is a great excess. 20 drops to an ounce of developer is under most circumstances sufficient. Never use more than is necessary to make the developer flow freely over the plate. When the nitrate bath is new, scarcely any alcohol will be required in the developer. You cannot do better than purchase the lenses and apparatus you name. They are not dear for the quality of the apparatus. If you desire it, you may purchase a cheaper camera and use with the same lenses, without serious disadvantage.

J. C.—We are obliged by your communication, which shall appear in our next. The portrait is very fine, and the group, although a little unexposed, possesses much merit as a composition. The only fault in either arises from a little falling off in the defining power of the lens towards the corners. The gentleman you name has not been for some time past the editor of the News, but is one of its regular contributors. We do not think any portrait is published, but will enquire.

J. S.—It is impossible to focus satisfactorily with a coarse ground-glass screen. But you cannot grey the glass properly for permanent use yourself. Most dealers in photographic glass keep the fine greyed glass for the purpose. We have procured it sometimes of Claudet & Houghton. Hyposulphite of soda being very cheap, and the result so important, it is better to reject it when there is any doubt of its b ing out of order.

T. W. S.—You will find the report upon your glass in the proper place. To photograph polished silver goods place them in a soft light, use bromo-iodized collodion, expose fully, and develop with iron.

J. G. L.—We received some queries with this signature this week, which are answered above. We do not remember receiving such a letter a few weeks ago, nor have we received any query which relates to the "Journal of the Photographic Society."

F. L.—Scotch glue will answer for mounting if you use care. Starch should be made fresh this hot weather, as it turns acid in a few days.

Thos. Rogers.—The prints enclosed are imperfectly fixed. Use stronger hypo, and use more care to secure perfect fixation. See answer to Clericus. If you use sufficiently strong new hypo, keep the prints moving about, and leave them a sufficient time in the fixing solution, you will have no further difficulties of this kind.

James.—Black varnish should not be used to alabastrine pictures. Use dark velvet instead.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

⁂ Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 158.—*September* 13, 1861.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

It appears to be admitted by universal consent that the annual meeting of the British Association, just held at Manchester, has been one of the most interesting and brilliant of the meetings which have been held since the Association was inaugurated thirty-one years ago. All the vast resurecs of accommodation and space which the manufacturing metropolis of the North possesses, was taxed to the uttermost, so large was the accession of members and associates, now numbering, we believe, upwards of 3,000. The magnificent Free Trade Hall was, on several of the soirees filled to over-flowing with a most brilliant assembly.

There is, to our mind, something especially satisfactory in the annual gatherings of an association of this kind, for the purpose of recounting, discussing, and summing up, as it were, the scientific progress of the year. True this is done from week to week, and month to month, in the press; but there is an inspiration derived from these personal meetings which cannot be too highly estimated. Renewed interest and impetus is imparted to the research in every branch of science, by the attrition of mind with mind, and the sympathy engendered amongst the explorers themselves, whilst an immense and beneficial influence is exercised upon the public mind thus brought into contact with the seductive charms of sciencitic inquiry, which in many instances, for the first time, discovers with Milton, that science is "not harsh and crabbed as some dull fools suppose," but a pursuit as solacing and delightful as it is elevating. Of course these meetings include a good deal of talking and dining. What is done in England without these? Talking is an important auxiliary to doing, and dining together is a process wonderfully promotive of harmonious co-operation. "At such meetings," it has been remarked, "men compare notes, get rid of the nonsense that obstructs great intents, and accelerate a clear understanding with each other. And such gatherings bring into play other great auxiliaries of progress—the dining-room and the drawing-room—where conversation, specially stimulated and concentrated upon definite subjects, gets over the ground splendidly."

The noble inaugural address of the president, Mr. Fairbairn, presents a most triumphant resumé, not only of the progress of science during late years, but also of its sound and practical character, and its immense influence on the daily well-being of mankind. In the constant advances towards a more perfect, and altogether higher knowledge of what, until very recently, have been amongst the sealed arcana of the universe,—photography has played a not unimportant part. If its position in the arts is doubtful, its value as the unerring recorder of facts in science cannot be disputed, and has received graceful recognition on several occasions during the proceedings of the association. Its aids in the progress of solar science, and astronomy generally, especially in the records of the late solar eclipse, are admitted facts of the highest value. Its records of magnetic and atmospheric perturbations are such as could not be obtained by any other means, and their importance cannot be too highly estimated.

The directly photographic contributions in the sections were not very numerous; but there was much matter nevertheless of direct and incidental interest to photographers, selections or abstracts from which we shall, as our space permits, lay before our readers. The account of the photographic operations in connection with the solar eclipse, and the recent progress of celestial photography as detailed by Mr. Warren De la Rue, will be found in the present number. We have received from Mr. Sutton his paper on "The Panoramic Lens," read in section A, which will appear in our next.

The complete series of photographs taken by Mr. De la Rue in Spain of the progress of the solar eclipse were amongst the most interesting of the multiform scientific illustrations which adorned the Free Trade Hall. They are enlarged from the negatives so as to form transparencies on glass of about six inches in diameter, and show every stage from the first impingement of the moon's disc to the total obscuration, in which the luminous prominences are very beautifully rendered. There were also paper prints showing groups of the whole of the gentlemen of the Spanish expedition on board the "Himalaya," and also a long panoramic photograph of Mr. De la Rue's station in Spain. At the conclusion of the Astronomer Royal's lecture on the eclipse, Mr. De la Rue exhibited some interesting photographic transparencies of the eclipse by means of the magic lantern, including one of the totality, which were very interesting. Of the photographic exhibition held in connection with the association we give particulars in another page.

We may here express our regret that the indisposition of Mr. Mercer deprived the association of one paper which would, we apprehend, have possessed great interest—the application of photography to textile fabrics by dying processes. Mr. Mercer has given much attention to the photographic action of a variety of salts, and we saw a specimen of portraiture dyed on fine muslin. At present we do not see any especial economic value attaching to such an idea; but this in no way detracts from the interest of the researches, as a distinct assessment beforehand of the commercial value of his results would be but a poor stimulus to the enterprise of the experimental philosopher.

The oft-repeated story of Franklin's answer to the enquiry, What is the good of such and such a discovery? is to the purpose here. The philosopher of the lightning answered the question with another: What is the value of a new born babe? It is to the possibilities as well as to the actual results we must look in all experimental philosophy; and we trust Mr. Mercer will be enabled to proceed with his researches, and that we shall not have to wait until another meeting of the British Association before we hear more of them.

Our space precludes the possibility of entering into the subjects discussed at the association generally, much as they interested us, but as we have said, we shall again refer to those subjects having a direct photographic bearing and interest.

THE ART CLAIMS OF PHOTOGRAPHY.

Is photography a fine art? With all submission to our correspondent R. A., and those who hold similar opinions, we maintain that it is. It is both an art and a science, or perhaps more correctly speaking it is, like many of the arts, whether polite or industrial, an applied science, or an art based upon a science. We are not at all concerned to refute our correspondent's arguments, by which he endeavours to prove that photography is essentially a science, although perhaps he would have been more exact if he had simply affirmed that it was a branch of chemical science. Science is the grand foundation upon which all the arts are based, and we readily admit that for the successful practice of the art of photography, a more comprehensive knowledge of science is necessary, than is needed for the prosecution of any other art. We have yet to learn, however, that the necessity for completer education, or higher culture of a given kind in the artist, should involve any derrogation to the art. To succeed perfectly as an art-photographer, the student requires all the art-knowledge of the painter. He should be perfectly familiar with the laws of composition and chiaroscuro, have a perfect appreciation of the balance of forms and of tones, and their value in his work; and be a master of those higher qualities, relating to concentration of interest, expression, &c., which give unity, purpose, and character to a picture. He needs not to learn the mechanical art of drawing, or applying pigments; but in place of this, he must acquire a perfect knowledge of the chemistry of his art, and such a practical knowledge of optical laws as will enable him to choose, and use, his lenses efficiently.

But there is no such difference in the mechanical part of the duties of each as to constitute an essential distinction in the character of the art. If the painter require more skill with the hand, the photographer requires more activity of the brain: if the drawing of the one be more under his own control, the result of the other is generally more absolutely true and exact.

All painting is not fine art; nor all painters artists. Our correspondent "R. A." admitted the existence of photographs which were gems of art, but attributed these to the skill of the artists producing them, not to the art by which they were produced. To "the man, not to the method." Why what trifling is this! Are not all the art treasures of the world of art due to the "man and not to the method?" Are the productions of a Buonarotti works of fine art because he was at once poet, painter, architect, and sculptor, or are these arts fine arts because they are capable of giving form and expression to the grand conceptions of the artist's mind? "Photography *per se* is not," we admit, "a fine art;" neither is painting. Daubins annually covers acres of canvas with paint, and his works sell very well by the square yard; but Daubins is not an artist, nor are his pictures fine art. Painting, like photography, is to a certain extent a mechanical art; like photography, although in a less degree, it requires some knowledge of chemical science, for without an acquaintance with chemical constitution of his pigments, and their action upon each other, the painter would produce sorry results. To the enamel painter the chemistry of his materials is an important study, for on the chemical action of heat upon vitreous pigments depends much of the beauty of his work. But these facts do not detract from the art value of the results, or in any way impair the claim of the methods employed, to a position among the fine arts.

We claim for photography a position amongst the fine arts in so far as its productions are worthy to be called works of art, in so far as it gives pictorial expression and effect to the mind of the true artist; just as in like manner we only admit to painting and the other polite arts the same position on similar grounds. We grant that its range of expression is more limited than that of painting; but in what it can achieve how perfect is the achievement! It cannot imagine. Well, no. Neither can painting. But it can, in a more limited degree, we admit, like painting give effect to the imaginings of the painter; witness the works of such men as Rejlander, Lake Price, and Robinson. It cannot idealize. No: but it can be true, and the rapidity with which it can seize a fleeting characteristic or expression frequently enables it to "snatch a grace beyond the reach of art." It cannot select or combine. Well, as to the combining, that it is a moot point; some photographers think it can; but we will waive that at present. As to selection, however, that is just where the art-photographer's strength lies. He can select, and when he is a true artist, it is in the selection that the value of the picture consists. Position and accessories in portraiture, point of view in landscape, conditions of light, atmosphere, &c., &c., all admit of selection, and in this selection, combined with the manipulation and chemical control, which enables him to give delicacy or force; decision or dreamy atmospheric softness to the whole, consists chiefly the art-character of the result. It can select and has reproduced some of the most lovely forms in which Nature presents herself. And that art which can select, pourtray, and perpetuate beauty we affirm to be a fine art.

A photograph is not a mere mechanical reproduction of whatever is placed in front of the camera, like that given by a mirror, and the truth of which would depend on the mechanical perfection of the mirror. The art character of a good photograph does not even consist in judicious selection only, but on the skilful management of every step in the operations, and the result must depend upon the artist having a distinct conception of what he wishes to produce. With him, and as with the painter, the picture must first exist in his own mind, and he will impress his own characteristic ideas of beauty upon it. Not simply in the varied degrees of mechanical excellence, such as the different degrees of skill and care in a workman may produce in a piece of mechanical handicraft, but the different kinds of pictorial beauty such as the artist conceives, are possible in the photograph. The individual genius of the photographer, as well as that of the painter, may be stamped upon his work. Photography, too, has its masters in different styles, as painting has. The grander phases of imaginative art, it is true, are unsuited to its powers. But in rendering the calm beauties of nature, the graceful and true in portraiture, the unmistakeable purpose and intention in genré pictures, photography can boast of its masters, each having a distinct individuality. Who that has given the subject fair attention has not been reminded of Wilkie and Webster by the genré studies of Rejlander? of Sir Thomas Lawrence by the portraits of Williams? Of Sant, by those of Lacy? Are finer or more characteristic portraits than the Lord Brougham and Lord Derby of Mayall, to be found amongst those of Grant? Are the interiors of Bedford much surpassed by those of David Roberts? In Lake Price we are often reminded of Leslie; in Claudet, of Sir Joshua Reynolds; in Wilson, of Turner; in Heath, of Claude Lorraine; in Mudd, of Constable; in some pictures recently issued by hitherto comparatively unknown artists—Jackson, brothers—we are forcibly reminded of Ruysdael, and other Dutch masters. We know that on reading these comparisons there are some who will charge us with comparing great things with small; but we, nevertheless, maintain that the mental characterstics, the genius, which produced the paintings, are manifested to a large extent in the photographs; that the men are in the best sense of the word artists, and that the works and the process are worthily designated by the term fine art.

We have not attempted in these few remarks to define the term fine art. We have rather chosen to show how photographs comply with the conditions popularly regarded as constituting fine art in paintings, and how, notwithstanding limitation and modifications, the methods by which each are produced, and their excellence secured, are in many of their elements identical in character. That there is much photography which is not art, and few photographers who are artists, we admit; but we repudiate entirely the justice of the decision, which would judge the higher claims of an art by a consideration of its lower phases, and an examination of the works of the bunglers amongst its votaries. But we repeat that we claim for photography the position of a fine art, just so far as it can be used as a vehicle for giving expression to the conceptions or perceptions of beauty, in the mind of a true artist, in the same manner as painting, sculpture, engraving, &c., can embody similar ideas of beauty.

Our correspondent animadverted, in severe terms, on the position assumed by the Photographic Society in relation to the classification of photography in the forthcoming International Exhibition. On this subject we have little at present to say. We give the Council of the Photographic Society credit for the very best motives, and a concern for the honour of the art, in the steps they have taken; but as we have before stated, we cannot but think they have, as the issue shows, made a mistake. We believe that had they appointed a committee, all might have been gained, probably, for photography which could be desired. It is scarcely probable that Her Majesty's Commissioners could have any unworthy desire to insult photographers. In offering a separate room, we believe they offered the best possible thing for every purpose. We regret much the issue, and should the rumour prove true that the Commissioners themselves contemplate appointing a committee, and submitting the names for the approval of the society, we should be glad to see the council avail themselves of the chance of retracing, to some extent, the steps they have taken. We apprehend that the Commissioners will have no difficulty in finding men sufficiently interested in the progress and honour of photography, who are either not connected with the society, or who we apprehend are scarcely committed to the present decision of its council. That photography is rich in men suitable for position, we cannot doubt, when we remember such names as Talbot, and Hunt, and Herschell, and Wheatstone, and Lake Price, and Rosling, and Fowke, and Sir Charles Eastlake, and Sir William Newton, and a host of others. We anxiously wait, however, the progress of events, and confidently hope for photography, from all parts of the world a satisfactory and creditable appearance in the great display of the world's industry, science, and art.

[Several letters on this subject stand over for want of space, but will appear in our next; amongst these will be one from M. Claudet.]

MANCHESTER PHOTOGRAPHIC EXHIBITION.

The exhibition of photographs in the Exchange, at Manchester, is by no means the least interesting of the various displays of science and art opened to the members of the British Association, and is of sufficient excellence to render it matter for regret that it is only intended to be of a temporary character.

The first feature that strikes us on entering the room, and glancing around, is the fact that notwithstanding the short tenure of the Exhibition, there is more attention to classification and arrangement than we have often seen in collections of photographs intended for exhibition during an entire season. We find, for instance, prints from collodio-albumen negatives, all hung together, and so with those from oxymel, Fothergill, and other dry collodion processes. Then we see prints from wax-paper, wet collodion, and calotype, all separately classified, so that we do not find it necessary to examine the corner of every picture—there is no catalogue—for details of the method of its production. Then we find landscapes together in one place, portraits in another, reproductions in a third, illustrations of photolithographic and photoglyphic processes in a fourth; illustrations of photochemistry, and the results of different printing processes without the salts of silver in a fifth, and so on throughout. The pleasure and instruction derived from an examination of specimens so classified, and the facility in remembering them which it affords, are materially enhanced by this arrangement. The time and thought bestowed by the committee in the first instance, are reaped a hundred-fold by visitors afterwards.

Perhaps one of the most interesting contributions to the exhibition, is half-a-dozen frames of old calotype portraits, many of them twenty years old. Some of our readers may remember them, for those who have seen them will not readily forget them; we refer to those of Hill and Adamson. We say it with some hesitation, because after twenty years progress it seems a somewhat unpleasant admission to make, but these portraits excel in interest, at least, ninety-nine per cent. of the photographic portraits produced at the present day. There is a grandeur, a power, an absence of the common-place and vulgar, which forcibly reminds one of the best paintings by some of the old masters. True their tones are brown and rusty, there is an absence of delicacy and minute detail; but the arrangement and massing of lights and shadows, and above all the easy, natural, but thoroughly artistic management of position and accessories constitute the chief charm. We strongly commend a study of these pictures, for position and arrangement, to all portraitists who have the opportunity of examining them. There is nothing strained, nothing theatrical, nothing unusual, but there is nothing vapid and common-place. The educational influence of a study of these pictures, in that respect, we consider to be invaluable. As regards the permanency of these old calotypes, so far as we can judge, they are little changed: their shadows are brown, and their lights perhaps in some instances slightly yellow; but they do not exhibit the symptoms of decay so often seen in pictures of a much later date, when "his sulphur majesty" began to reign over the destinies of photographic prints. The gentlemen who produced these pictures will produce no more in conjunction. Dr. Adamson is dead: Mr. Hill, whose name we now see associated with Mr. McGlashen, has contributed two or three pictures to the present Exhibition, which, with the modern improvements of the art, combine many of the qualities which give such value to the old calotypes.

We now turn our attention to the collodio-albumen pictures. As might be expected, in Manchester, the Exhibition is very strong in this process, the specimens occupying the whole of one side of a long room. We are bound to add, moreover, that the quality is equal to the quantity, and that a non-photographic observer, if directed to choose a process by the results here exhibited, would inevitably select the collodio-albumen. Amongst the exhibitors in this department, foremost both as regards numbers and excellence, are the specimens of Mr. Mudd. We have so often described and praised the pictures of this gentleman, that our readers are perfectly familiar with their characteristics. Considered as a whole, in selection of subject, position, and light, and in manipulation throughout, they are the best photographs we know. This opinion may largely arise from our admiration of many of his subjects, but to us there is an indescribable charm in his treatment of them, there is such delicacy, detail, and texture combined with great vigour, and the unmistakeable presence of atmosphere, all combining to make a perfect photographic landscape. We do not, in saying this, in the slightest disparage the skill of many other excellent photographers, whose productions we admire; we simply mean that these please our individual taste most. Mr. Mudd has here several new pictures, some of which have fine natural clouds, a somewhat unusual accompaniment to prints from collodio-albumen negatives. Of these the "Valley of the Tay" is a fine specimen; and another, "Scawfell in Clouds" has a very striking effect, the top of the "pike" or peak, being hidden in the clouds which drive over its summit. Another good picture of moorland scenery is "Eskdale from Birker Fell," a panoramic picture, printed from two negatives on one piece of paper, making a picture about 21×9 inches. One of the best amongst Mr. Mudd's new pictures is a "Bridge over the Braan near Dunkeld." The rustic stone bridge, embowered in, and surrounded by beautifully rendered foliage, the transparent water and its fine reflections, all contribute to make a picture leaving little to be desired. Another picture which pleased us with its thoroughly transparent water reflecting some glorious foliage, is entitled "Wood and Water." Mr. Mudd has several other fresh pictures, of which, however, the limitations of our space preclude a description at present.

Mr. Sidebotham contributes some of the finest collodio-albumen pictures in the Exhibition. Amongst the best of these is one of Chepstow Castle; if this picture had been a little less cold in tone it would have been perfect. The composition is very fine, the view including a portion of the shingly beach, and some shipping, as well as the castle. Mr.

Sidebotham in this and two other very fine pictures, a view of "Tintern Abbey," and one of "Fountain's Abbey," avoids a fault very common amongst many young, and some old, photographers, that of making the building fill the picture, so as to exclude entirely its surroundings. Now it often happens that a large share of the beauty and character depend on these, not only as suggestive of the *genius loci*, but as materially adding to the value of the composition. In all these pictures there is exquisite delicacy without the slightest loss of force. Mr. Sidebotham has also a very large picture about 20 inches by 14 inches, of "Strine's Cottage," this is less valuable as a composition, but is very fine photography.

Mr. R. O. Clark exhibits some very artistic collodio-albumen pictures, chiefly views in Edinburgh. They are all, more or less, good pictures and fine compositions, notwithstanding some movement occasionally in the figures. A view of "Cowgate" is very perfect indeed, as is also one of the "High Street." Many of these pictures are full of atmosphere, and leave but one thing to be desired; that is, the absence of some manufactured clouds. We do not say that every attempt to introduce by artificial means clouds into a photograph is rank heresy; but it is a matter in which the legitimacy must be decided by the result. The unsuccessful rising of a people against constituted authorities is rebellion, and the rebels are condemned to die; the successful issue of the same rising would be revolution, and the revolutionists establish a new dynasty. When clouds are introduced into a photograph so that they pass for those of nature, or even to the practised eye only raise a doubt of their origin, they may add much to the effect of the picture; but when they strike at a glance as manufactured articles, it is a pity they should deface good pictures. The simpler the forms, and the fewer the number of introduced clouds the better will be the result; but a multitude of small clouds, with some attempt at drawing in their forms, are rarely successful. These remarks must not be taken, however, as bearing reference to all the pictures of Mr. Clark: they are suggested by one or two, but the majority of his pictures are very fine indeed, and exhibit much artistic feeling.

Mr. Edward Mann exhibits a few very good photographs amongst which we may mention a most charming picture entitled "High Torr, in Derbyshire," and also a schooner, being apparently an instantaneous picture on a dry plate. Mr. C. Buxton exhibits some very fine Egyptian and other eastern views, taken on collodio-albumen plates, which, if not equal to Frith's, will bear in many respects not unfavourable comparison with them. Some very fine collodio-albumen pictures are exhibited by Mr. Wardley, and some also by Mr. A. Smith, a pupil, we believe, of Mudd's.

There is a collection of upwards of a dozen 10 by 8 specimens illustrating the modification of Petschler and Mann, taken we believe by Mr. Petschler. These are chiefly scenes in Derbyshire; they are well selected and well manipulated, and constitute in many respects very fine pictures; but we are bound to add, with all deference to the opinions of many excellent photographers, that we do not think the process as here exhibited bears favourable comparison with the collodio-albumen proper. The pictures lack brilliancy and crispness; there is a slight dullness and heaviness which strikes us as belonging to the process, and is the only fault of many otherwise excellent pictures.

The hot water process and the tannin process each put in an appearance, but not in great force. By the latter a fine and large picture, about 16 by 12, is contributed by Mr. J. Annan, "Loch Ranza, Arran." It has some suspicious looking clouds, but as it is marked "untouched" we are bound to believe it is so. Mr. Annan also contributes some excellent pictures by the wet process. The only prints from "hot water" negatives are by Mr. J. H. Young, and are very good. There are some transparencies by the same process, but the tone strikes us as unpleasant for transparent pictures.

The waxed-paper process has not many exhibitors, but those we see almost make us regret that this process is little more than a thing of the past. Mr. Sidebotham, Mr. Wardley, and Mr. Hooper, each exhibit some fine specimens: one or two of Mr. Sidebotham's, we think, scarcely to be surpassed by any process.

A frame of instantaneous stereoscopic pictures is exhibited by Messrs. Smyth and Blanchard, chiefly consisting of views in London, and on the Thames. Amongst some of rather mediocre merit, there are a few that are exceedingly fine. "Sunset on the Thames at Greenhythe" is a charming picture of water, cloud, and atmosphere, scarcely surpassed by anything we have seen of this kind.

There are two or three very charming little pictures by Wilson, of Aberdeen. They are described as "Taken with Dallmeyer's triple achromatic lens, No. 1, focus 7 inches." The pictures are about 7 inches by 4½ inches, including an angle of about 60°, and giving perfect definition all over. As was remarked by several connoisseurs looking on, one of the great charms of these pictures is the wide angle giving such a large amount of subject. This is a point to which we are glad to see much attention has been given of late amongst the photographers.

The consideration of the wide angle naturally brings us to Mr. Sutton's panoramic lens and pictures. A complete set of apparatus sent by Mr. Ross, and one of the specimens before noticed in our pages, "The old church at St. Brelades, Jersey," excited much attention, and the specimen was much admired.

Mr. Brothers contributes some very fine specimens of portraiture and reproduction. A copy of the large group of officers of the 84th, the picture measuring 48 inches by 21 inches, excites a good deal of admiration. It is unquestionably one of the most successful specimens of composition grouping we have seen. Mr. Brothers also exhibits some cartes de visite and coloured portraits. A coloured photograph on ivory is peculiarly beautiful, soft, delicate, and transparent.

There are two or three solar camera pictures, but all coloured. Whether contributed by the photographer or colourist, is not stated; but they are not such as will enhance the fame of either. One a portrait of the celebrated tenor, Giuglini, is a positive libel. Giuglini is really a gentlemanly-looking, and somewhat handsome man, with a clear, but deep Italian brunette complexion; this is a coarse face, with hue of brick dust; and as if to enhance the unpleasant effect, light blue is the tint prevailing in the background. The other, a portrait of Mr. S. Smyth, is a more carefully finished picture, but the flesh is very raw. It looks as if Apollo's flaying process, recently described by Oliver Wendell Holmes, had just been accomplished, and done somewhat cruelly, the god cutting somewhat deeper than is his wont.

Mr. H. P. Robinson contributes a few very good pictures; "Early Spring" is a charming landscape. An illustration from Tennyson's "Idyll's of the King," "Elaine with the shield of Launcelot," is, in many respects, a very fine picture. The conception and composition are good, the model is charming, and the photography satisfactory. We are reminded, however, of a criticism of Ruskin's on an Academy picture of a child rescued from drowning by a dog. After praising the drawing, &c., Ruskin says, naively enough, "I never saw a child pulled out of the water by a dog; but *wouldn't its clothes be wet?*" Now the shield which awakens Elaine's fantasies would, we think, show more dints and bulges, traces of the heavy usage which make her exclaim—

> "And ah, God's mercy, what a stroke was there,
> And here a thrust that might have killed !——"

Mr. Robinson is a good artist, and has produced some very fine pictures. This is one of them; but it might have been improved by a little more thought here, we think. In the same direction errs another very noble picture of the same class Mr. Robinson contributes, entitled "The Lady of Shallott." This picture is full of poetry; is finely conceived and executed. It has, however, a few minor faults of detail. As we shall have more to say on this picture than our space here permits, we defer comment for a separate notice.

We have only space to briefly indicate many other excellent and interesting specimens, some of which are old favourites and have been noticed in these pages before. There is one of Mr. Kibble's instantaneous pictures of a steamer at full speed, sea and fine clouds, produced, we believe, on a collodio-albumen plate. Mr. Heath has some excellent specimens of landscape, as also has Mr. Dixon Piper. Mr. Herring some fine specimens of portraiture and reproduction; and also a very interesting frame of psychological studies, consisting of portraits of the same persons during insanity and after restoration. Mr. Mayall has some of his recently issued large portraits of statesmen and cartes de visite of the royal family. Mr. McAndrew has some very fine portraits. Cundall and Downes a series of reproductions of Turner's "Liber Studiorum."

There are very interesting specimens of various printing processes with uranic and other salts, some old Daguerreotypes, and other specimens connected with the early history of the art, and some microscopic specimens contributed by Mr. Dancer. Specimens of various photo-engraving processes by Herr Pretsch; specimens of zincography by Col. James. Some few other specimens may possibly have escaped our attention, as the temporary character and purpose of the Exhibition did not render the preparation of a catalogue desirable. The Exhibition is throughout, notwithstanding, one of the most interesting we have visited.

PURE PHOTOGRAPHIC PAPER.

There are so many difficulties in the manufacture of photographic paper from rags, arising from accidental mechanical impurities, that not even the most scrupulous care on the part of the manufacturer suffices to avoid them. The imperfections arise chiefly from particles of metal, bronze, or iron, from the knives employed in cutting the rags; occasionally there are others arising from the consistence of the paper pulp, which accumulates in little knots.

What the photographer requires is a homogeneous cellulose paper, and it seems likely that the beautiful and important problem of producing it is solved by the transformation of wood into a pulp suitable for making a strong paper, eminently adapted to printing of all kinds; but especially for engravings, and which may be advantageously substituted for the China or India paper now in demand for proof impressions.

This problem had previously been solved in a scientific point of view, but the process was too expensive for industrial application. It was necessary to act upon the wood in the state of shavings, with large quantities of soda, in the form of a hot and concentrated *ley*. The recent improvement of the process is suggested *by a lady* of an active and intelligent mind, who has quite overcome the obstacles which seemed to stand in the way of an economical production of the wood paper, and consequently presents to the manufacturer a white paper pulp at a price of about one half the cost of rags. Her secret consists almost entirely in a new dividing implement, which reduces the wood to a condition resembling lint or tow, at a single blow, which is afterwards readily acted upon by the cold alkalies and acids required to bring it to the state of pure cellulose, which is subsequently bleached by chlorine.

The dividing instrument, or cutting machine, is a kind of steel hedgehog; it consists of a series of parallel vertical wheels, armed with fine points, which are made to pass under pressure into the substance of the wood in the direction longitudinal to its fibres. The points penetrating to a very minute depth into the wood, say the thickness of a sheet of paper, produce on the upper layer of wood a kind of canvas of woody threads; a plane then placed transversely across the wood removes this layer of threads, which constitutes the lint or tow-like substance which is ready to be acted upon by the soda and chlorine. Under these conditions, a power of three or four horses suffices to furnish in the course of four-and-twenty hours the materials for a ton of pulp, without the aid of the cutting cylinders required for reducing rags to a pulp, and consequently with a great economy of the motive power.

A great many varieties of paper may be produced by an admixture of the pulp of rags with that of the wood, 10 to 20 per cent. of the former to 90 or 80 per cent. of the latter. The texture, thickness, and colour of the wood paper may be varied also at pleasure by modifying the fineness of the cutting machine and other resources. Specimens have been submitted to repeated and careful trials at the hands of lithographers, copper-plate, and letter-press printers, who report unanimously in favour of the new paper, which costs only one-tenth the price of India-paper. It now only remains to test its suitability for photographers, of which, *à priori*, there appears but little doubt. This discovery seems quite providential at a time when the scarcity of paper-yielding material causes great anxiety in the minds of those who see the demand constantly outstripping the means of supply.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Nitric Acid.—This important acid is usually prepared on the large scale by distilling commercial nitrate of soda—Chili saltpetre—with oil of vitriol in large cast-iron cylinders. Owing, however, to the difficulty of getting this salt pure it is preferable for the experimentalist to prepare it on the small scale from nitrate of potash. This salt is not easy to obtain free from chlorine, and as this latter body is a very annoying although a very frequent impurity in nitric acid, it is advisable to take some pains at the commencement to get rid of it. The purest commercial saltpetre (nitrate of potash) should be obtained in the first instance: this should be tested for chlorine by dissolving a crystal or two in water, and adding to the liquid a drop of nitrate of silver solution. If a white precipitate takes place, showing the presence of chlorine, the whole of the nitre to be employed should be purified by crystallization. For this purpose dissolve as much of the salt as possible in hot distilled water, filter, if necessary, from suspended impurities into a clean evaporating dish, and set on one side to cool; taking care to keep out the dust by a cover of bibulous paper. When cool the bottom will be most likely found to be covered with crystals of nitrate of potash; pour the supernatant liquid from them into another dish and allow the crystals to drain. When dry test one of them with nitrate of silver as at first recommended. It will, in all probability, be found to be free from chlorine. If, however, it should still be impure a second recrystallization will render it fit to use. The mother-liquor poured off the pure crystals of nitre will most likely yield a further crop of pure crystals, or if not quite pure they may be rendered so by a second crystallization. In this way the impurity of chlorine may be gradually eliminated, until by a judicious series of crystallizations the whole will be found concentrated in a small volume of liquid which may be thrown away without any loss worth mentioning.

The nitre having thus been obtained free from chlorine, powder it finely, dry it, and place 100 parts in a glass retort with 96 parts of oil of vitriol. The ingredients should only be sufficient to about half fill the retort otherwise there will be danger of the mixture boiling over. The neck of the retort must be connected to a proper condensing tube, and the extremity of this must pass far into the receiver; no cement being used for any of the connections. The nitre must be put into the retort first and then the oil of vitriol. If the retort be tubulated the acid may be poured in through the opening, but if not it must be introduced down the neck by means of a bent funnel tube, and care must be taken not to soil the neck of the retort, with any of the acid. Heat must now be applied by means of a deep sand-bath, and the mixture submitted to distillation until the residue in the receiver is tranquil and no more drops come over. If the nitre has not been quite purified from chlorine, there will be at the commencement of the process an evolution of a yellowish red mixture of hyponitric acid vapour and chlorine gas. As the whole of the chlorine will come over at the commencement of the distillation, the distillate should be tested from time to time by allowing a drop or two to fall into a dilute solution of nitrate of silver. As soon as a white cloud ceases to be formed, when the acid and silver mix together, the receiver should be changed, and a perfectly clean one placed in its stead to receive the remainder of the distillate which will be perfectly pure nitric acid. The neck of the retort and the condensing tube should be cooled by a current of water trickling over it, and the receiver should have wet bibulous paper surrounding it, which is kept constantly wet with a stream of cold water. If the operation has been properly conducted from 100 parts of pure nitre, there will be obtained about 66 parts of nitric acid 1·5 sp. gr. This may be further concentrated by mixing it with half its volume of oil of vitriol and distilling it again at a low temperature, until only sulphuric acid is left in the retort. The distillate will, however, be contaminated with sulphuric acid, from which it must be purified by distilling it again, from a few crystals of nitrate of potash. Thus purified and concentrated nitric acid is a colourless transparent liquid (frequently, however, coloured yellow by hyponitric acid). It has a faint but characteristic odour and a highly acid taste, reddening litmus, and exercising a highly caustic and corrosive action on organic substances, staining those containing nitrogen, such as the skin and nails of a yellow colour. When very strong it absorbs moisture from the atmosphere becoming gradually weaker. In its concentrated form, it has a specific gravity of 1·52 and contains one atom of the anhydrous acid with one atom of water. In this state it decomposes in boiling, evolving stronger acid, and becoming ultimately of the specific gravity 1·42, when it boils regularly at 248° F. Nitric acid dissolves copper with evolution of yellowish red nitric oxide gas, producing a green solution. When slightly diluted with water, it attacks tinfoil, producing an insoluble white powder. It has no action on gold, platinum, and some of the rarer platinum metals, unless it is mixed with hydrochloric acid. With these exceptions it attacks and dissolves all metals forming in most cases crystallizable nitrates. Its use in the manufacture of nitrate of silver has already been described in our former chapters, and is too well known to our readers to need further mention at present. Nitric acid is also the agent used in the manufacture of gun cotton. Our readers are likewise so well acquainted with this operation that further comment upon it is needless. Carbon is oxidized by strong nitric acid, a piece of red hot charcoal plunged into concentrated acid continuing to burn with vividness. Sulphur is oxidized by it into sulphuric acid; the action, however, is difficult to carry on until all the sulphur is oxidized, unless the latter is finely divided, and the acid very strong: if the liquid be boiled the sulphur fuses, and the action is slow. Nitric acid mixed with hydrochloric acid forms a mixture of chlorine, water, and hyponitric acid, which is usually called *aqua regia*, from its property of dissolving gold, the "king of metals." When a nitrate is dissolved in a little water and mixed with twice its volume of oil of vitriol, then allowed to cool, and a crystal of protosulphate of iron dropped in, it assumes at the surface of contact a rose, purple, violet, or blackish brown colour, according to the quantity of nitrate present; the smallest trace of the latter being sufficient to produce a red tinge. This is one of the most delicate tests for nitric acid, and is frequently of great use, as it is occasionally of importance to ascertain whether nitrate or nitric acid is present in any given solution.

What is commonly known as fuming nitric acid, or nitrous acid, is properly speaking a mixture of nitric acid containing but a small quantity of water, with hyponitric acid. It is obtained by distilling 2 parts of dry powdered nitre with 1 part of oil of vitriol. At first, half of the nitric acid present passes over in the form of ordinary strong nitric acid; the temperature then has to be considerably raised, when the other half of the nitric acid comes over being split up into oxygen and hyponitric acid. The oxygen goes off whilst the hyponitric acid is absorbed into the nitric acid already in the receiver. It is thus seen to be a mixture of two separate acids, and is quite a different substance, chemically speaking, from real nitrous acid. It forms a yellowish red liquid, of a specific gravity of 1·536, and emits fumes of the yellowish red colour of hyponitric acid, but darker.

When diluted with a small quantity of water, the colour changes to olive green, an evolution of nitric oxide gas taking place; a larger quantity of water changes it to pale blue, and a still further addition renders it colourless. This fuming acid has even stronger oxidizing properties than nitric acid itself of an equal degree of concentration, and is therefore to be preferred to the pure acid, where it is required merely for its powers of communicating oxygen to other bodies.

THE NITRATE BATH AND ITS TROUBLES.

SIR,—I have had some difficulty lately with my nitrate bath, and as it caused me some trouble in getting right again I have thought that a narration of my experience might be interesting. Usually I am very successful with my bath, and it is the one thing among my chemicals that I never trouble myself about. I have even presumed myself upon it, and when I have heard and read about others having to do this and that to their baths, I have thought how much better I fared who never did anything to it. But many persons, beginners especially, really have a mania for punishing their bath. They seem to think that a plain unsophisticated solution is too uninteresting to perform their exploits with, so they proceed to doctor it, administering homœopathic or allopathic doses of acids and alkalies alternately. The originally vigorous constitution is entirely undermined by this physicking, it can't stand it, so it becomes ailing and weakly, requiring frequent attention, occasionally change of air, now and then a little sunshine, often refreshment, and sometimes a good rest. The last fashionable recipe, when it is squeamish and out of order, is to put it through a course of oxide and nitric acid. A rival school of professionals pin their faith to acetate of soda and acetic acid. There are those again who believe only in ammonia and carbonate of soda, and when doctors differ who's to decide? With Shakesperian air then I exclaim, "Throw physic to the dogs, I'll have none of it," and content me with a solution of plain unadulterated nitrate of silver. For many years I have worked with a primitive solution of this character, and well has it served me, only requiring refreshing occasionally with crystals and water. But recently my good old friend has given indications that all was not well with it. It could not do the work it formerly did; it was inclined to break down with half the number of whole plates that it formerly carried with ease; it had evidently passed its grand climacteric, decay of nature had set in; it had fallen into its sere and yellow leaf. It might, however, be only overwork; possibly there was life in the old bath yet; perhaps the hot weather and hard work had been too much for it, the "cartés de visité" might have been too many for it, and like its master it required its autumnal relaxtion. A little rest, some change of air and a good bronzing in the sunshine, might re-invigorate it and him too.

To remedy existing evils then an entirely new bath was determined to be made. This reminds me an of anecdote. I was one day buying some photographic articles in a shop when a gentleman entered, evidently an amateur, and addressing the proprietor said, "Oh, if you please there is something the matter with my bath, can you tell me what it is?" "What *is* the matter?" said he. "Oh, it don't work well." "Perhaps it is you that don't work well." "I am sure it is the bath, it is quite out of order. Can you tell me what to do with it?" "Yes, I can. "Do tell me, please, for I am so anxious to take nice pictures." "I can tell you how to prevent that bath giving you any more trouble." "Pray what *shall* I do with it," said the man hurriedly. "*Pour it down the sink and make a new one.* I adopt that plan myself. and never knew it once to fail," was the cool reply. The gentleman looked "sold," bought two ounces of crystallised nitrate, and retired crestfallen.

In my present distress I bethought myself of the advice of this *disinterested* shopman, which struck me, however, as being more summary than logical. I did not see the necessary connection between the two clauses. If I poured the old bath down the sink, of course I must make a new one; but then I might make a new one without giving my old friend the sack. And this resolve I took, for I felt sure my old servant was not entirely done up, it was only temporary indisposition, overwork, and want of rest, digestion out of order, been taking some nasty iodide that did not agree with it, perhaps the alcohol had got up in its head; or the ether might have prostrated it; at any rate I labelled it "old and disabled," and putting it on the superannuated shelf, thought that, like an old pensioner, it might do me some service yet in the day of need. My invalid bath tenderly disposed of, I proceeded to make a new one, using similar nitrate of silver to that I have been in the habit of using for long time, 4s. per ounce, 3s. 9d. for five ounces—I generally save the odd threepence's, they pay for my News. I made my bath in the proper manner; dissolved the silver in a small quantity of distilled water, put in a little iodide of potassium to iodize it, added the rest of the water, agitated well, and then filtered. I then added the small quantity of acid I usually find necessary to make it work clear, and proceeded to take a picture. Judge my surprise when I poured on my developer—I always work with iron—to find the whole plate fogged. What new trouble is this? thought I; again and again I tried with similar result. I added a little more acid, still fog; put more and more acid, until a very serious quantity was introduced, and though an improvement was effected, still nothing like a decent picture could be propuced. I therefore gave it up for a bad job, put it into a separate bottle, and labelled it "insane,"—it was clearly deranged, and beyond control—and I placed it beside my old and disabled bath. I proceeded then to make another new bath, being determined this time to avoid all chances of error, and watch everything closely as I went along. I was careful before, but this time I would be doubly so. I commenced by washing out my glass measure with strong nitric acid, served my glass bath and dipper the same; selected only the best formed crystals of nitrate, weighed them carefully in the clean glass pan, dissolved them properly in distilled water, got a new glass stirring rod, used some iodizing solution this time to iodize with, and finally filled up with the rest of the water and filtered. I now tested, and it was neither alkaline nor acid, simply neutral, and I added just that small quantity of pure nitric acid, that I knew by long experience ought to make it work right. Whatever mistake there might have been in my former bath, I was certain there was none in this, so with considerable anxiety I tried a plate, using my regular collodion and developer. How shall I describe my mortification at seeing the same fogging as before. I felt I could dance with rage and passion; I should like to have thrown bath and chemicals out of the window, and I am afraid the language I used was more energetic than polite.

At this period a customer came in and diverted my thoughts, must have a portrait at once, could not wait; so I took down my old effete bath that I had *not* thrown down the sink, and did the best I could with it, and bad was the best. This together with some dinner enabled me to cope with the bath again. I knew that adding acid in any reasonable quantity was no use, and I suddenly thought of Laborde's method of adding iodine to prevent fogging. Certainly your own remarks and experiments were not very assuring, but when a man is in trouble he will do anything to extricate himself, so to make a long story short, I tried the iodine dodge in several ways, small doses first, large afterwards, but excepting producing yellow precipitation and causing frequent filtrations, I saw no change whatever, and certainly no relief from the fog. I consider the iodine plan a failure, it did not answer with me or cure my bath. I then thought of another plan, adding ammonia to alkaline and exposing to the sun. Fortunately a blazing sun was out that day and my bath got a good cooking. the bottle nearly roasted, the solution nearly boiled. It quickly turned muddy and nearly black, ah! thinks I, there's the fog separating at last, presently I'll filter it out. The ammonia has acted as a purgative, and expelled the foul matter; the poor solution has certainly had something that did not agree with it, that it could not digest; nothing like a good clearing out when the stomach is out of order." So I filtered it, and had the satisfaction of seeing a black sediment on the filter-paper. I acidified it with nitric acid till litmus paper was decidedly red. Now I thought I was all right; and to give my bath the very best chance, I cleaned a few plates unusually well, and carefully collodionizing one, immersed it in the bath. Oh how anxiously I waited the two or three minutes it was being sensitized. I exposed it on my printer's devil—the boy who breaks all the negatives and swears they were cracked before—and hurriedly rushed to develop. "To *fog*, or not to *fog*, that is the question" with me; how I watch the young imp as he "comes out;" his snub nose and dirty shirt were never so interesting before. Yes, the picture is out; now for the cyanide, when lo, as the iodide disappears it reveals my old enemy spread all over the plate. There is the young image nipped in the bud, choked with the fog, not only killed but buried under it too. Who shall describe my vexation and mortification at such a finish to all my labours? I flung myself into my uneasy chair, and felt inclined to give up the fog and the ghost at the same time.

What *shall* I do? For two days I had been putting off my customers, and they would be put off no longer, and my head was as full of fog as my bath. This time I really did feel inclined to follow the tradesman's advice and pour the bath down the sink, there to associate with other muddy solutions. I bottled it however, and, considering the several ineffectual attempts I had made to get it in order, I felt warranted in labelling this one "incurable," and I put it beside the others on the shelf—my photographic hospital I called it. Matters were now serious with me, and I sat down to reflect on the probable causes that produced this trouble. It was no use making a third bath as I had made the former two. The nitrate bath is formed of distilled water and nitrate of silver, and one of these must be the cause. I now remembered reading of persons complaining that they could get no good silver. Mr. Hardwich used to deliver long lectures on impure nitrate of silver; at the time I smiled at all this because I was never bothered from this cause, but now these facts were brought fully home and I sympathised where I formerly laughed. I thought that my turn had now come to have a spell of bad silver. It *must* be the silver—it could be nothing else *but* the silver—why had I not thought of that before? So out I went, bought some fresh silver, went to one of those shops where they are supposed to sell something superlatively perfect—and where they make you pay for it too, whether it is or not—and gave five shillings an ounce for it. It did not *look* any better than what I had at home. The proof of the pudding is in the eating thought I, so I made a new bath, exposed a fresh plate, and, will you believe it? To my shame I must confess it, *it* was as foggy as any of my preceding ones. How humbled and mortified I felt those only know who have passed through similar trials. To think that I who could advise everybody, *I* who never got into trouble, I who laughed at others when they spoke of a foggy bath, should make bath after bath and find them all useless.

But it was no use indulging in self-depreciation. That would not set me right. One more patient was added to my hospital, "complaint unknown." The nitrate of silver was not the offender, for that obtained from the immaculate chemist at the heavy price was no better than that obtained from the less pretentious tradesman. There was just one chance more; the distilled water, clear and transparent as it looked, *might* be the real delinquent. I had heard of persons in out of the way districts making their baths with common river water, and in sheer despair I set about to make one more new bath with the silver I ordinarily use, my faith being shaken in the more expensive article.

As I expected, the solution was very milky with the chloride and carbonate of silver formed, but filtration set all that to rights, and after adding the small dose of acid required, I prepared another plate. Of course I expected to see my old enemy, in fact I had almost despaired of ever getting a clean plate any more, when to my astonishment the picture developed clear and brilliant without a vestige of fog. Hurrah! three cheers!! "Richard's himself again." "Here John," I called out to my assistant, "run after that gentleman and bring him back; tell him it was all a mistake, he *can* sit to-day." Thus I traced out my enemy at last. It was not the traduced nitrate, it was the deceitful water; the silver remains untarnished, and the water is condemned.

Henceforward photographers take warning by my fate; and when your newly-mixed, and slightly-acid baths fog, do not hastily condemn your silver, but look sharp after your water, and on a case of emergency, do not be afraid of using good clean household water, even to make a bath with.

An Old Hand.

British Association for the Advancement of Science.

THE PROGRESS OF CELESTIAL PHOTOGRAPHY.

BY WARREN DE LA RUE.*

At the Aberdeen meeting I had the honour of communicating to this section a report on the state of celestial photography in England, which has since appeared in the Transactions of the Association. Since that period, I have pursued my investigations in this branch of astronomy, and ascertained some facts which I believe will be of interest to the meeting. In the first place, I beg to recall to the recollection of members who may have read my paper, and restate for the information of those who may have not done so, that it was intended at the period of the Aberdeen meeting, that the Kew photoheliograph should be taken to Spain, in order, if possible, to photograph the luminous prominences, or, as they are usually called, the red flames, seen on the occasion of a total solar eclipse. The words implying a doubt as to the success of the undertaking were advisedly inserted, because so little information could be collected from the accounts of those observers who had witnessed previous total eclipses as to the probable intensity of the light of the corona and red flames in comparison with other luminous bodies. My impression was that I should fail in depicting the prominences in the time available for doing so, because I had had the Kew instrument tried upon the moon, and failed utterly in getting even a trace of her image on the sensitive plate, and the corona and prominences together were supposed not to give as much light as the moon. I therefore pointed out the desirability of other astronomers making attempts to depict the phenomena of totality by projecting the image of the prominences direct on to the collodion plate without enlarging it by a secondary magnifier, as in the Kew instrument. It was fair to assume, with the great experience I had acquired in celestial photography, that I should succeed with the Kew instrument if success were attainable, and I knew that far more reliable results would be obtained by this instrument than by the other means I recommended should be employed as the surer means of obtaining some record. Two theories existed, as is well known, to account for the red prominences,—the one prominently supported by the Astronomer Royal was that they belonged to the sun; the other, which is still supported even by an astronomer who obtained photographs of them at the last eclipse, was that they are produced by the diffraction of the sun's light by the periphery of the moon. It will be seen, therefore, how essential was it not only to obtain photographic images of the prominences, but also how important it was to obtain such perfect images of them that they could not be confounded with the purely diffraction phenomena, if such existed, and that the images should be on such a scale that the defects common to collodion could not be confounded with them. "The pretty near" would have been far more readily accomplished; but having the whole bearing of the subject fully impressed on my mind, I preferred to make a bold venture, and either accomplish what I aimed at or fail entirely. Fortunately I was successful, and to that success the steadiness of my staff much contributed. We now know that the luminous prominences which surround the sun, for they do belong to him, can be depicted in from twenty to sixty seconds, on the scale of the sun's diameter equal $\frac{4}{3}$ of the object glass employed. That is to say, an object glass of three inches aperture will give a picture of the prominences surrounding a moon four inches in diameter. The next subject I have to call your attention to is the photographic depiction of groups of stars, for example, such as form a constellation like Orion—in other words, the mapping down the stars by means of photography. I have made several experiments in this direction, and have obtained satisfactory results; and I believe that, at last, I have hit upon an expedient which will render this method of mapping stars easy of accomplishment. The instrument best adapted for this object is a camera of short focal length in relation to the aperture like the ordinary portrait lens, the size of lens being selected to suit the scale of the intended photographic map; and the camera of course mounted on equatorial stand, with clockwork motion. The fixed stars depict themselves with great rapidity on a collodion plate, and I have experienced no difficulty in obtaining pictures of the pleiades by a moderate exposure even in the focus of my telescope, and they would be fixed much more rapidly by a portrait camera. The difficulty in star-mapping does not consist in the difficulty of fixing the images of stars, but in finding the images when they are imprinted, for they are no bigger than the specks common to the best collodion. It is of no service attempting to overcome the difficulty by enlarging the whole picture; but something may be done by causing the images of the stars, which are mere spots, to spread out into a cone of rays by putting the image out of focus, and thus to imprint a disc on the plate instead of a point. Last year has been so fully employed that I have not yet had time to fully develop this method, but I have ascertained its practicability. Some curiosity naturally exists as to the possibility of applying photography to the depiction of those wonderful bodies, the comets, which arrive generally without anything being known of their previous history, and absolutely nothing as to their physical nature. It would be valuable to have photographic records of them, especially of their nucleus and coma, which undergo changes from day to day, and hence such a means of recording their changes as photography offers would be the best beyond comparison, if the light of the comet were sufficiently intense to imprint itself. On the appearance of Donati's comet in 1858, I made some attempts to delineate it with my reflector on a collodion film, but without success; and on the appearance of the comet of the present year, I made numerous attempts, not only with my telescope, but also with a portrait camera, to depict it, but even with an exposure of fifteen minutes (minutes, not

* Read on Thursday, September 5th, in Section A.

seconds), I failed in getting the slightest impression, even with the portrait camera. Hence this conclusion may be arrived at, that the actinic ray does not exist in sufficient intensity in such a comet as the last to imprint itself, and, therefore, photography is inapplicable to the recording of the appearances of these wonderful bodies. I now return to heliography. Experiments conducted at the Kew Observatory by my request, have shown that for an image of the sun of any given size when once the aperture of the telescope has been ascertained which is sufficient to produce the picture with the necessary degree of rapidity, it is not beneficial to increase that aperture, that is to say, no more details are depicted, nor does the picture become sharper so as to bear a greater subsequent enlargement in copying than when the smaller aperture is used. It has also been ascertained experimentally that it is not well to enlarge the image beyond a certain point, by increasing the magnifying power of the secondary magnifier, so as to cause the rays to emerge at a greater angle. These results are such as I should have anticipated; but as it was nevertheless desirable to produce pictures of the sun's spots, with a view to their closer study, on a scale considerably greater than the pictures produced by the Kew Observatory instrument, I commenced some operations of my own for trying whether it would be possible to procure such pictures with my reflector. On maturing my plans, I found that the apparatus which it would be necessary to append would be so weighty, that the telescope would require to be strengthened considerably, to support the additional weight in the awkward position it had to be placed, and it did not at first appear how this could be conveniently done. Ultimately, I found the means of adding a radius bar, and of supporting the plate holder which carries a plate 13 inches square, at a distance of four feet from the eye piece. But here another difficulty occurred, namely, that the image of the sun was so powerfully heating, that if allowed to remain for a very short time on the instantaneous slide, it heated it and ultimately set fire to some part of the apparatus. A trap easy to be moved over the mouth of the telescope had to be contrived so as to open just before the instantaneous apparatus was brought into action, and again shut immediately afterwards. At last these mechanical difficulties were surmounted, and I commenced my experiments to ascertain the best form of secondary magnifier; these experiments are still in progress, and some important difficulties remain to be overcome before pictures of the sun's spots will be obtained with that degree of sharpness which shall leave nothing to desire. With an ordinary Hayghonian eyepiece, employed as a secondary magnifier, and placed somewhat nearer the great mirror than its position for the most perfect optical picture, in order to throw the chemical rays further on, so as to bring them to focus on the plate, I have obtained some sun pictures of very considerable promise on the extremely large scale of the sun's diameter equal 3ft. These pictures have only been very recently procured, and I submit them to the section because I believe that an interest is felt in the progress of celestial photography, and that our members prefer to take part in the experiments as it were by watching their progress, rather than to wait until the most perfect results have been brought about. I may state the mechanical and chemical difficulties have been surmounted, and the only outstanding one is the form of the secondary magnifier. When this has been worked out, perfect sun pictures three feet in diameter will be obtainable with a telescope of one foot aperture in less than the 20th of a second of time. These pictures, when taken under suitable circumstances, may be grouped so as to produce stereoscopic pictures, which must throw considerable light on the nature of the spots. It appears to me that such results must be of value to science, and that such records of the state of the sun's photosphere, both as regards spots and other changing phenomena, which are obtainable by means of photography, are worth collecting and discussing. It is agreeable to me to work out the problem, so as to point out the means by which success is attainable, and I may for a time carry on the records; but it will, on reflection, be seen that these observations, if continued as they should be for years, are likely to prove a serious tax upon the leisure and purse of a private individual.

Professor Chevallier said that having been in Spain during the eclipse, he could bear testimony to Mr. De la Rue's achievements. He himself had the opportunity of making one experiment, which showed that the light of the corona was brighter than that of the moon; for the light of the corona was visible through a thickness of glass, which on trying it on the moon extinguished the light. The whole scientific world was indebted to Mr. De la Rue for paying such great attention to a branch of science promising such important results, more especially as applied to the delineation of the stars.

The Rev. Dr. Robinson thought that the matter ought not to be left with mere praise and admiration of what Mr. De la Rue had done. The means by which the Association had done so much in fulfilling its mission of a benefactor of mankind, was by acting uniformly on the principle that whenever a member was found gifted with peculiar aptitudes and powers, his services should be secured, and himself encouraged to press forward with his work. It was clear that the way was open to a new department of knowledge—that a new instrument of research was at command. Let them avail themselves of it to the fullest extent. They certainly had no right to trespass upon Mr. De la Rue's zeal or time; but he (Dr. Robinson) was sure that if they followed up the question, they might reckon upon Mr. De la Rue's assistance in directing and superintending. He hoped that an application would be made by the section to the Committee of Recommendations; and he had no doubt that the Royal Society would join in affording the means, to a great extent, of prosecuting the researches so successfully begun.*

The President said that it was impossible to over-value the importance of the self-registration in all ways. A good many years ago, at his instance, the Association took up the subject of the self-registration of magnetic phenomena, which had been further carried out by the assistance of money from Government. It was certain that the more recondite observations became, the more it was felt that man was a very poor creature, and that matter was very superior to him. Only put a machine in order to do work, and it would do it much better than any man could. Mr. De la Rue had spoken of the precision with which he got images of the stars. The precision was so great that the images were so small that they could scarcely be made out—not from want of visibility, but because they were scarcely distiuguishable from spots on the collodion. Some time ago, in America, the difficulty was the other way; for, from the state of the atmosphere, the images of the stars were in a constant shake, so that every instant there was a different image, and the result was impressions rather large and blurred. He trusted that the time would come when the transit of stars would be made to register themselves The means were not wanting; because in America the course of a star across the field of a telescope had traced itself photographically. It would not be difficult to arrange so that this course should refer itself to seconds of time on a transit clock. The image was continuous so long as the light showed itself; but by galvanic connections with the beat of the clock, it was possible at every second to stop the light, so that a succession of images would be got, giving a distinct register of time by the star, and thus, to some fraction of a second, it can be fixed when the star passed a given point of view. He wished specially to call attention to one of the photographs—an image with the edge of the sun; and he wished all to observe the rapid degradation of light towards the edge. It was maintained by M. Arago that the light of the sun did not decrease sensibly to the edge; that it was uniform throughout. That was never his (the President's) opinion; and he gave to M. Arago some reasons for differing from him. If M. Arago did not choose to believe him, he had reasons for his doubt; but if he disbelieved the evidence of this photograph he would have no reason for so doing. It was a matter of public scientific importance that the use of the photograph for the things now referred to should be perfectionated; and as he fully concurred in what the Rev.

* We here remark that £150 was subsequently voted by the committee to be placed under the control of Mr. De la Rue.

Dr. Robinson had said, he thought it was most desirable that the Committee should confer with Mr. De la Rue, with a view of securing that effective and direct superintendence without which, in such observations, nothing like practical advance could be made.

ON DEVELOPMENT BY IRON, WITH SUBSEQUENT INTENSIFYING BY IODINE WITH RE-DEVELOPMENT.

The advantages gained by iron development for negatives is in many instances of the utmost importance. Where objects liable to move are being photographed, it is one of the greatest helps that has been gained by the photographer. Negatives developed by iron, however, seldom have sufficient density to yield vigorous prints: it is, consequently, necessary in most instances to have recourse to some intensifying process, by which vigour sufficient for good printing may be gained. Various plans of giving density to feeble negatives have from time to time been proposed; but I am inclined to think that for simplicity and certainty of good results, no plan has been advanced equal to that by iodine with subsequent re-development.

The plan I have been in the habit of following, and which has yielded most satisfactory results, is as follows:— The collodion used is prepared in accordance with the formula for negative collodion given in the Photographic News Almanac for 1861. Nitrate bath, 35 grs. nitrate of silver to 1 oz. water (neutral). Expose about half as long again as for a positive. Develop with a ten grain solution of iron, to which half a drachm of glacial acetic acid has been added just before use. Development is carried out till all detail is brought out, being careful not so push it so far as to veil the extreme shadows. Fix in a weak solution of cyanide; wash well.

If the exposure has been well timed, the picture will now have all the appearance of a good negative by reflected light; but on being viewed by transmitted light, although all detail is visible, it will be much too transparent to print. The density may, however, be brought up to any degree by the following intensifying process:—

The formula for the iodine intensifying solution given in the Photographic News Almanac of 1861, is too strong; it is difficult to cover the plate with it, so as to obtain equal action over the whole surface. A solution of half the strength (iodine, 1 grain; iodide of potassium, 1 grain; water, 2 ounces) will be sufficient, and a large plate may be covered equally before the action commences. Considerable care is required in the application of the solution of iodine, so as not to carry the action too far; in which case the chances are that the negative gets spoiled.

I have lost several excellent pictures by over-doing them with iodine. If the deposit of silver in the film gets converted into iodide through its entire thickness, it is almost impossible to bring up the density by any amount of re-development. It is best to convert a very thin layer only of the deposited silver into iodide. The plan I have found to succeed best is as follows:—

After having well-washed the fixed picture, and before it has had time to dry, carefully flood the plate with the iodine solution, allow it to remain on till the thinnest parts of the deposited silver just begins to show a tendency to take a whiter shade; then throw off the solution, and wash very well. When the iodine is well washed from the film, pour over it repeatedly the ordinary pyrogallic developing solution; then expose to a strong light for a few minutes: a slight darkening of the lights of the picture takes place during the exposure. Now carry the plate to the dark room, and re-develop with the pyrogallic solution, to which a few drops of silver solution—nitrate of silver, 20 grains; distilled water, 1 ounce—has been added. The intensity of the picture comes rapidly up, and may be brought to any degree, by renewing the pyrogallic solution with silver; a moderate degree of intensity in the negative, however, will be found to give the most brilliant prints; by making the lights too intense, you get only a hard inharmonious print.

The negative when finished will show from the *glass* side as a good positive.

This method of intensifying may be carried out either before or after the picture has been dried after fixing; but, if done after drying, the film has a strong tendency to tear from the edges of the glass, which is a chief fault in other intensifying processes. If the intensifying is done before the plate has been dry, the film will bear any amount of washing under a tap without showing the slightest tendency to give way.

The plates, if kept in a close tin box, will remain quite wet for at least 24 hours; but if it is wished to keep them longer, I have no doubt that a solution of glycerine in water poured over them would keep them moist any length of time. I have, however, never tried the glycerine, not having had occasion to keep my plates more than ten or twelve hours. T. C.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 11th September, 1861.

I am inclined to think that the greatest "revolution in photography" will be effected by M. Bertsch's contrivances for the successful working of *automatic* photography, which possesses great claims upon the attention of amateurs, inasmuch as it enables the operator to obtain *certain* results with the least possible expenditure of labour and skill. Moreover, it reduces the baggage to a minimum, which, of a certainty, is not the least important element in the "revolution."

Photographers are under great obligations to M. Bertsch for the many ingenious contrivances he has provided for their use, but none compare in value and importance with his automatic camera, with its accessories, which need occupy only a corner in a dressing-case or writing-desk. Arrived at the scene of action, the photographer is relieved from the care and trouble of focussing, an operation, which with ordinary cameras, is so tedious and uncertain, except in experienced hands. With the automatic camera, images are obtained so accurately, that even when magnified three hundred times no deformity is apparent. A description of the apparatus, and of the theory upon which it is constructed cannot, I think, fail to be interesting and useful to photographers. The construction of the automatic camera is based upon the law of the principal focus, and not upon that of the conjugate foci, and, consequently, it admits of our obtaining from a point ten paces distant from the instrument to the extreme horizon, all the planes of the landscape with due distinctness, whatever be their relative distances. The negatives obtained with this little instrument are so delicate, that they may be submitted to an enlarging of three hundred times, if upon collodion, or of six hundred times if upon albumen.

The camera when placed at the same distance from the objects in the foreground at which the artist places himself in studying from nature, gives to every object composing the landscape the same relative dimensions they appear to have to the eye Far from presenting, as the photographs taken full size at once on the spot do, the aspect of a flatness as if on a canvas, the proofs obtained by the automatic camera possess a real perspective exactly conformable to that presented to the eye by the natural objects themselves; this result is due to the sharpness and prominence of the foreground.

A simple illustration will demonstrate the advantage these proofs possess over those obtained by ordinary methods: if the operator wishes to apply the law of optics which permit him to obtain a landscape wholly in focus, from the nearest objects to those most distant, he will proceed as follows:—

Suppose that he wishes to take a proof of the dimensions of 20 square inches, to have it all in focus the objective must have a focus of 65 inches. With such an instrument it will be necessary to place the camera 140 yards from the foreground. At this distance the nearest objects subtend at angles so small, their dimensions, relatively to the horizon, will be so insignificant, that they will become confounded with the more distant planes, and contribute only very feebly to the perspective effect. Artists are quite justified in condemning this radical defect in photography. For what painter would place himself at a distance of 140 yards from his foreground in studying from nature?

In making a rational application of the laws of optics, M. Bertsch has rendered this service to photography:—of permitting the travelling photographer to obtain proofs under the same conditions in which the artist places himself in copying nature. Taken at a dozen paces from the objects constituting the foreground, the negatives of the automatic camera are stereographs of remarkable fineness, and, upon being enlarged, yield the most natural perspective effects; they are true pictures, deficient in nothing but colour.

M. Bertsch has reduced the entire baggage of the travelling photographer working with wet collodion in the open air, to the following dimensions: the laboratory, which contains the camera, chemicals, dishes, and all the indispensable appliances, is but 10 inches long, 4 inches wide, and 14 inches deep. It resembles a landscape-painter's colour-box, which, upon being opened, is converted into a little dark-room or tent, which admitting one hand only, by means of a little sleeve, all the preliminary operations of wet collodion, sensitizing, introducing the plate into the camera, developing and fixing after exposure, are performed. The camera is a copper cube four inches square, which is screwed on to a walking stick, which opens to form a tripod. Previously regulated for all distances, this camera requires no focussing; it has no ground glass, and in order to ascertain if the desired landscape is refracted upon the sensitive plate, it is only necessary to observe if it occupies and fills the little frame placed on the top of the camera. The laboratory will contain chemicals sufficient for more than one hundred proofs.

For enlarging the negatives of the automatic camera, M. Bertsch has constructed a simple instrument which is readily put in operation. In stating that this instrument is only an application, to the picturesque, of the microscope with which the inventor has reproduced almost invisible objects of natural history in colossal dimensions, it is scarcely necessary to remark upon the fine detail it gives to the proofs.

In applying these principles to the automatic camera, M. Bertsch has constructed a complete little apparatus, which is a camera that scarcely covers the palm of the hand, and with which, without focussing, we can obtain, for any distance, those little portraits of the size of a pins' head, perfectly sharp and distinct, which have become all the rage. It is very curious and interesting to look at these microscopic points through a powerful magnifier, and see them transformed into pictures full of the minutest detail.

SUNDAY PHOTOGRAPHY.

Sir,—As the question of sunday-trading in photographs has been lately causing more than the usual amount of attention to this subject, a few words on the matter will not be amiss.

It has been suggested that this practice should be put down, but how? that is the question, and a most difficult one to solve. In this country we do not like interference with private trade, no matter what kind of commerce it may be, so long as it is not a nuisance or a danger to the general public. Now it may be a very difficult thing to prove, sir, that if I or you, or any one else choose to work within our own rooms, and receive pay for our work on Sundays, that we are doing anything that can be brought under the cognizance of the police; how then can we bring these parties within the cognizance of the law?

A correspondent in your last suggests that it would be best for photographers to demand that they should be taxed to the extent of £10 or £20 a-year, but I submit that this would be a thing not to be thought of in these free-trading times. The tendency has been for some years past to disenthral trades and professions from taxation of all kinds. Even the lawyers' fees have been reduced, that he pays for permission to fleece Her Majesty's subjects, and shall the most liberal and most advancing of all professions set the example of retrogression, by placing a heavy tax on the practice of its various branches, and thus burden those who without having offended are made the scapegoats for others' sins? If government proposed such a tax on the practice of our beautiful art, there would be a never-ending cry against such a burden.

But if the law cannot interfere, and we may not tax these people, how then are we to proceed? Could not the clergy and the most respectable class of the population take this matter in hand? for I submit that it is the general public and not the photographic world who have the real power in the matter. It is an axiom of free trade that supply and demand keep pace with each other, hence I infer that the demand must be made to cease ere the supply can be cut off; indeed the supply will fail as a natural consequence; for this reason I repeat that the cause and the remedy for sunday-trading in photographs is in the hands of the public.

Every respectable photographer would, as a matter of course, be delighted to see an end to these vile dens where photography is daily made the means of victimising numbers, who not being, unfortunately for us, learned in art, are imposed upon too often at a price at which a conscientious man would be glad to supply them with a genuine art photograph, nor would a tax, I opine, be a sufficient guarantee against the system complained of. It has become almost a proverb, that real talent, and the possession of means, are seldom combined in the same individuals, at least not at the commencement, and how many really clever and respectable men might be deterred from entering the profession, because they had not money to pay for a licence? and who could tell how much loss it might be in the future advancement of the art, to keep men of ability out by such tyrannical means? and would it deter those who bring so much disgrace on the profession from fear of the expense? Why, sir, I am told that many of these Sunday traders take £4 and £5 on a Sunday, and even more at times; and as most of this amount is I presume taken in low priced portraits, it will show at once where the blame really lies; it is the public who support these dens who are the parties really in fault, and *time* with the increase of *art* education, the supply of *good* work at a *moderate* price by respectable men, and the admonition of those who can best influence their flocks appears to me the only sure remedy for what has become to all classes; both those who create and those who supply the demand, a very great evil.

The only excuse I can make for the length of this communication is the importance of the subject and the necessity for a right understanding of the means at our command for rectifying the evil.—I am sir, yours respectfully,

E. E. L.

[The public unquestionably have the matter largely in their hands; but we are afraid that the portion of the public who support Sunday photography are not very accessible or amenable to argument on the subject. As we have before said the law cannot interfere with the private Sunday practice of photography or any other profession, but when it becomes an overt act, and, as in the case of touting, a public nuisance, the law can and ought to interfere.—Ed.]

Photographic Notes and Queries.

Stereo Exchange Club.

Dear Sir,—I am also of opinion with other members of the above club that some better regulations are desirable. I do not, however, think the suggestions I have seen would prove perfectly satisfactory. Under the present arrangement each individual member is completely ignorant as to the negatives possessed by the others, consequently he has not the least idea of what he will receive in return for those sent out. It is very probable that some members possess views which would be highly valued by others, but who are not aware of their existence. I think you will agree with me that this information is very desirable.

The plan I, therefore, propose is that every member should forward to you (or to some other disinterested and competent gentleman who would kindly consent to act as adjudicator) a print from *all* his negatives, so far, at least, as regards those he wishes to exchange. These to be formed into a list to be sent to each member, who would thereby be enabled to make a selection from the different subjects by intimating he should wish to receive certain views in return for his own. If you considered any of the prints forwarded were not up to the mark, *these to be excluded from the list*, and their omission would convey the necessary hint as to their quality far better than by hurting one's feelings by any classification. The lists to be re-issued as often as may be thought advisable, perhaps every two months during the summer would not be too often to give members the opportunity of having the new stereo's they had taken added to the list, first having them submitted for approval as before.

By this means each member would feel *certain* of getting no inferior prints, and would also have the advantage of selecting the subjects he wished.

The cost of printing the lists would be but trifling, and I do not think the members would object to the slight expense and the trouble of sending you the prints, when the advantages derived would be so considerable.

A somewhat similar plan to this was suggested by Mr. Henderson last year (p. 311, vol. iv), but as it only partially obviates the defects at present existing, I think the above alterations to the scheme are necessary for its thorough efficiency. —I am, dear sir, yours truly, Stereo Ex.

To Correspondents.

*** In compliance with the wishes of many of our subscribers we have thought it prudent to defer the completion of the fifth volume of the Photographic News until the end of the year. The termination of the volume at the end of eight months is complained of as indefinite and troublesome; a volume containing the whole of the numbers issued during twelve months it is thought will be more convenient for reference.

*** It has just come to our knowledge that at least three or four letters addressed to us by post have never reached our hands; a circumstance to which we shall have to call the attention of the Post Office authorities. Since the same thing may have happened in cases of which we at present know nothing, we shall esteem it a favour if any of our correspondents who may not have met with attention, will communicate with us again, and let us know as definitely as they can the date and place of publication of such letters.

Susanna.—We cannot just now refer to the formula to which you allude; but you will find the following answer your purpose for developing negatives to be intensified: protosulphate of iron 15 grains, glacial acetic acid 15 minims, water 1 ounce, with sufficient alcohol to make it flow freely. Our correspondents, in making reference to matters which have appeared in the News, and desiring information regarding them, should always give the page and volume. They would then save us many hours of unnecessary labour in seeking for the subjects to which they refer.

W. O. W. S.—Mats and preservers are chiefly made in Birmingham, we cannot give you the names of makers; but may mention Mander as one of the best. Trays, cases, &c., are made both in Birmingham and London, by a great many makers. You will probably see their names in our advertising columns from time to time.

A Troublesome Photographer desires us to inform him "which is the best and cheapest photographic journal that is published up to the present time," adding, "I don't care whether it comes out weekly, monthly, quarterly, or otherwise; I want you to advise me the best to take," &c. Take! Why take the Photographic News, to be sure; we, of course, think it best, and of course strive to make it such. Take all the others if you can afford it; but by all means take the News; being the only weekly photographic paper, it must furnish the fullest and most prompt information.

A Junior Photographer.—The tide runs in this direction. Another enquirer wishes to know the best monthly or quarterly journal devoted entirely to photography. There is no such quarterly journal, and the only monthly journal is that of the Photographic Society, which is chiefly devoted to a record of its own proceedings. The only Photographic Dictionary published, except that in our pages, is Sutton's, which is now out of print. We believe a new edition is contemplated; but cannot tell when it will appear. We think it is not commenced yet.

F. L.—Avoid the use of nitric acid for an iron developer for negatives. Use acetic acid in equal proportions to the iron.

Josephine.—The best method of recovering silver from your waste baths, washing water before fixing, &c., is to keep a large stone jar holding two or three gallons; into this turn all solutions containing nitrate of silver, and put in from time to time a handful of common salt. This will throw down the silver in the form of chloride, and after standing a few hours you may pour off the clear solution, which will contain no silver. When a large quantity of chloride has accumulated, take it out, dry it, and begin again. The reduction of the chloride into metallic silver is scarcely a suitable operation for a lady. It will be best to sell it to the refiners, who will give you either cash or nitrate of silver for it. The same with regard to waste prints and clippings of sensitive paper. Bear in mind that it is only before they are fixed that these are of value. You will see the address of persons who purchase these things, occasionally, in our advertising columns. You may remove prints from the toning bath into clean water, and leave them there until all are toned, so as to fix the whole at one time, and not be attending to two operations at one time.

G. S. E.—The addition of a very small quantity of acid to your bath, or of a little tincture of iodine to your collodion, will probably remove the streaks. Look carefully to the surface of your bath before commencing to operate. Sometimes such streaks are caused by scum on the surface. Gum may be used for mounting, but it should be very thick and freshly made, as it soon turns acid. If made with boiling water it will keep about a week. Scotch glue or starch are better for the purpose.

J. G. L.—More details regarding toning processes will appear in our next. In the mean time you may use with advantage 1 grain of chloride of gold and half a drachm of acetate of soda in three or four ounces of water. 2. The collodion you name is not particularly well suited to iron development. 3. As the Stereoscopic Exchange Club at present stands, it is necessary to send specimens for our inspection. If the new arrangement come into force, the duty of inspection will be undertaken by the secretary.

J. H. Crampton.—The dissolving of the film is a casualty which occurs at times with all spirit varnishes, especially where highly rectified alcohol has been used in their manufacture. It depends, however, chiefly on the condition of the collodion. Some pyroxyline is partially dissolved by absolute alcohol: it is generally of the powdery kind. There are only two ways that we know of to avoid such an occurrence; the first is to be very careful, when the tendency is present, to apply the lowest possible degree of heat which will prevent chilling; and if that fail, to use another sample of collodion.

Excelsior.—The use of skimmed milk or serum of milk as a preservative for dry plates is very similar to the Fothergill process, and the manipulations are the same. You will find the best resume of the manipulations in the various dry processes of the Photographic News Almanac for this year. A Lerebour's landscape lens for views, 14 by 12, we should consider cheap at £2 10s. The quality of the lenses we consider good.

A. B. C.—It is difficult to say whether your negative be in fault or not from the print forwarded; but it is probably a little too thin. The chief fault of the print is that it is considerably over-toned.—Use the formula given above to J. G. L. Use a stronger silver bath, print in the shade, and tone less and more slowly. For glass positives use a nitrate bath of 35 grains with one drop of nitric acid to each ounce of solution. Develop with protonitrate of iron; or protosulphate 15 grains, glacial acetic acid 15 minims, nitric acid 1 minim.

Susanna.—To prevent the film leaving the plate, use, if you can, a nitrate bath with less acid. Let the film set well before immersion, and if these fail try another and less contractile sample of collodion. The spots to which you refer on the edges of Dr. Hill Norris's plates are at times caused by contact with deteriorating influences while keeping, and are most frequently met with in under-exposed plates. Expose more fully. If that fail, send a piece of a negative to Dr. Hill Norris, and he will have pleasure in helping you.

J. P. C.—The best resumé of the manipulations in the various dry processes is in the Photographic News Almanac for this year. The best details of the collodio-albumen process you will find in Mr. Mudd's article in our issue of August 16th. We have given several articles in the production of transparencies during the present volume; see pages 208, 221, 257, 280, and others. We are glad to learn that the treatment of the bath we recommended was successful.

The Secretary.—If you procure achromatic lenses, in pairs, of 5 or 6 inches focus, you doubtless may be able to mount them in wood so as to answer the purposes of the exhibition. We cannot tell you where to procure them cheap. Those by French makers are generally lowest in price. As it is a thing we have never done, we cannot give you certain information. The best stereo transparencies we know are those of Mr. Breeze of Birmingham, and next, those of Soulier and Ferrier. Their recent instantaneous views of Paris would be interesting in your exhibition. Mr. Fry has done some very fine ones, but we do not know whether he is publishing any at present.

J. L.—The chief faults of the pictures enclosed appear to be over-exposure in a very dull light, and over-development. Good views of landscapes cannot be obtained in a bad light. We are not fond of acetate of silver in the bath for dry plates. The addition of acetic acid to your bath would make the plates a little less sensitive, but would aid you in obtaining brilliancy.

G. S. S.—We are glad to see that there is considerable progress in your results, and that you have a correct appreciation of what is required. By all means remove the "stopping out" from the sky. Turpentine will probably dissolve the black varnish, and a little gentle friction will remove it without hurting the spirit varnish underneath. The letter shall appear.

Eothen.—You will find further information respecting Bertsch's automatic camera in the letter of our Paris correspondent in the present number. We are not aware of the price, or of any agent in this country.

Enquirer, H. A. B., James Maginn, and several other correspondents, in our next.

Letters from several correspondents and other articles in type are unavoidably compelled to stand over till next week. Our absence from home attending the meetings of the British Association, has caused unavoidable delay in attending to some communications.

THE PHOTOGRAPHIC NEWS.

VOL. V. No. 159.—*September* 20, 1861.

PHOTOGRAPHY A FINE ART.

We call the attention of our readers to the full and lucid treatment this subject has received at the hands of our correspondents who answer "R. A." The masterly and exhaustive statement of the case by M. Claudet, we think, must carry conviction to the minds of the most prejudiced. In our next we shall have one or two further remarks on the subject, and on the recently published letter of M. Silvy, in which he, in point of fact, admits the whole question in dispute. The length to which the correspondence on this interesting question has extended compels us to defer much other interesting matter.

IRON NEGATIVES AND BRILLIANT PRINTS.

In resuming this subject we will, before speaking of the development, make a few remarks on diffused light in the dark room and camera as one of the most common sources of veiled shadows.

We may remark at the outset that where bromo-iodized collodion and iron development is used, much more stringent conditions, as regards the presence and the colour of the light, are necessary than where simply iodized collodion and pyrogallic development are used. The recent examinations of the coloured glass used in dark-room windows which we have undertaken for our readers, has made apparent the fact, that a very large proportion of the glass used for that purpose is a very insufficient protection to the sensitive plate in the dark room, when working the process of which we are speaking. In many of the samples of glass forwarded, whilst the blue, violet, and lavender rays are effectually excluded, the green, as well as the yellow and red, are admitted. Now, as bromide of silver is sensitive to the green ray, it follows that just in proportion to the amount of that light admitted, and the amount of bromine present in the collodion, will be the amount of general reduction, chiefly manifesting itself by a deposit upon the shadows and general veiling of the picture. We believe this is a common but unsuspected source of lack of brilliancy in iron negatives. The general appearance of the negative does not suggest such a source of error, because in pyrogallic acid negatives a thoroughly buried picture was not uncommon, and its printing qualities not seriously impaired by the condition. But, as we explained in a previous article, such a condition is fatal to brilliancy in an iron negative.

Another, and equally unsuspected source of veiled shadows in negatives by this process is diffused light in the camera. With simply iodized collodion, except when quite new, and pyrogallic acid development, the tendency is to reduction only where a brilliant light has acted; feeble rays are ignored, and hence it is that pictures with violent contrasts are produced without drawing in the shadows. With bromo-iodized collodion, and iron development, the opposite tendency is manifested; wherever a feeble ray of light has acted on the film of bromo-iodide of silver, the iron developer causes reduction. And thus it is that unobserved diffused light in the camera is acting all over the plate feebly, at the same time that the more brilliant light from the objects in focus is producing an image. This diffused light may proceed from several sources. The fact should not be forgotten, which is, however, scarcely ever remembered, that the lens is, in reality, a window in the camera; and whilst concentrated light from objects in focus passes through it, diffused light from every source which can reach it, also passes through. To some of our readers this fact may never have occurred, and, considerably startled, they may exclaim, "But how is this to be prevented?" It cannot be prevented entirely, but it may be reduced to a minimum, and care may be taken that when light has passed through the camera window, it shall meet with no reflecting surfaces, and be prevented, as much as possible, from falling on the sensitive plate. In a glass room there is always, of course, between the sitter and the camera, a certain amount of window, both at the top and side of the room, from which light is proceeding to the lens. As much of this as possible, it is desirable to cut off. As the rays of light from the objects in focus proceed to the camera in the form of a cone, the apex of which is just in front of the lens, a box or tube, blackened inside, should be attached to, or placed in front of the lens, widening towards the sitter so as to avoid cutting off any of the cone of rays which form the image in the camera. If such a box or screen as we have described be made to project about a foot in front of the lens, so as to cut off as much extraneous light as possible, the result, to those who have not before tried it, will be as gratifying as unexpected, in its effect on the cleanness of the shadows, and the brilliancy of the negative.

One of the next important considerations is to get rid of surfaces having the slightest power to reflect light, even when it has passed through the lens. To this end, the mounting of the lens should be carefully examined, and every part of the interior of the tube which could, by possibility, reflect light, carefully blackened with an absolutely dead black. The interior of the camera next demands attention. In a small camera a simple lining of black cotton velvet will be found more efficient than any method of colouring it black. If the camera be large, something more than a mere lining is desirable. A series of three or four diaphragms with apertures of graduated sizes to suit the shape of the cone of rays as they proceed from the lens to the sensitive plate, will be found invaluable. They may be made of wood or cardboard, covered with black velvet. All strong light entering the camera will thus be most effectually prevented from reaching the sensitive plate.

These precautions may at first appear trivial and unnecessary. To operators accustomed to simply iodized collodion and pyrogallic acid development in its less sensitive conditions, it is very probable they will do so. But we again affirm, that with a bromo-iodized collodion and iron development, conditions of a much more stringent character in this respect are necessary, and that on the attention to such minutiæ, much of the brilliancy and perfect printing qualities of iron negatives depend.

The development of the negative will next be the subject of some remarks.

Scientific Gossip.

Photography has been so frequently applied to microscopic purposes, especially in relation to micrometric appliances, that it will be interesting to our readers to know to what degree of minuteness their reductions can be carried without exceeding the limits of microscopic resolvability. The question as to how small a space can exist between lines, and still admit of their being separated under the microscope has long been undecided. The late Professor Queckett placed the limit of resolvability at the 1-75,000th of an inch; Mr. Ross placed it at the 1-80,000th of an inch, and Mr. De la Rue, in his extended examination of Noberts' test plate was unable to resolve any lines closer than the 1-81,000th of an inch. From this it would appear that the actual limit was about the 1-81,000th of an inch, which does not much vary from the theoretical deductions of Fraunhofer, and others based upon the physical properties of light. On the other hand there are authorities who assert that lines much closer than the 1-85,000th are resolvable: thus Messrs. Harrison and Sollitt have given measurements of striæ as close together as the 1-130,000th of an inch, and Mr. Sollitt in repeating these measurements expresses an opinion that lines as close together as the 1-175,000th of an inch can with proper means be seen.

Such being the conflicting testimony of distinguished microscopists, and the capability of the modern object glass for separating lines, it will be of interest to have additional evidence on the matter. This has recently been afforded by Messrs. Warnley and Sullivant, who have published an analysis from actual measurement of one of those marvels of art, Nobert's test plates. They were assisted in their research by instruments of unexceptionable quality, employing 1-12th and 1-16th object glasses, and one 1-30th, of 160° angular aperture by Tolles. In addition to this an amplifier, consisting of an achromatic concavo-convex lens, was introduced between the object glass and the eye-piece, by means of which a power of 6,000 diameters was obtained. Sunlight passing through appropriate achromatic condensers was employed to illuminate the test plate. The test-plate used consisted of 30 bands of lines, each band varying but little from the 1-2,000th of an inch in width, and having its lines a uniform distance apart. On one end was engraved the distance apart of the lines composing the various bands. These distances being in the 1st band 1-11,248th of an inch; in the 10th band the 1-40,943th of an inch; in the 20th the 1-67,413th of an inch; and in the 30th the 1-90,074th of an inch; in the other bands the lines being of intermediate distances apart. A careful analysis of this plate, with every microscopic appliance for distinct and accurate vision at the higher powers, showed that up to the 26th band there was no serious difficulty in resolving and ascertaining the position of the lines; but on this and the subsequent ones, spectral lines—that is, lines each composed of two or more real lines, more or less prevailed, showing that the resolving power of the object glass was approaching its limit. By a suitable arrangement, however, of the illumination, these spurious lines were separated into the ultimate ones on the whole of the 26th, and very nearly the whole of the 27th band; but on the 28th, and still more on the 29th, they so prevailed that at no one focal adjustment could more than a portion of the width of the band be resolved into true lines. The true lines of the 30th band they were unable to see. These experiments, which were repeated a considerable number of times, induce the authors to believe that the limit of resolvability with the best modern object glasses is about the 1-87,000th of an inch; but that this limit may possibly be carried somewhat higher, as the great advances recently made in the 1-30th object glasses shows that these have not reached a stationary point of perfection.

It would be an instructive study to ascertain the number of patents which have been and are daily being taken out for effecting the same object. Whether the subsequent patentees are really ignorant that the novelty for which they seek protection is already in common use, or whether the complication of the patent laws is such as to enable some trivial modification to be incorporated into and patented with an already known design we know not, but certain it is that most of the photographic patents which are now published seem to possess no novelty whatever. For instance, a patent has recently been taken out for a *novel* arrangement of the dark chamber used in photographic operations, which serves as a laboratory for effecting the sensitive process, and for taking and developing proofs in the open air with wet collodion, whereby these operations are performed with ease and rapidity. "On two sides of the dark chamber are placed two gutta percha troughs; one of the troughs contains a bath of nitrate of silver, and the other a bath of sulphate of iron. The troughs are hollowed at those parts where the glass plate is placed, and they are provided with external flanges, which allow of an inclination of 45° and even more, for certain positions without the liquid therein contained being spilt, which renders the apparatus suitable for transport. By this disposition of the apparatus the glass plate treated with collodion may be successively dipped into the two baths without its being taken out of the dark chamber, the motions of the said plate being suitably controlled by mechanism actuated from the exterior of the box." What in the name of all that's photographic does the patentee mean to claim? The description as far as we can make out from the above is simply a very old contrivance already patented by Mr. Newton, and used or suggested in endless modifications by correspondents in our columns; but whether the patent is for using gutta-percha troughs, or for putting them inside the camera, or for using baths of nitrate of silver, and sulphate of iron, or for using a camera at all, is more than we can attempt to say.

We have to report upon a few more specimens of glass which have been received since publishing our last account.

No. 21. F. R. This is a deep olive-green glass. In the spectroscope the spectrum is seen to be diminished to the red, yellow, and green rays, part of the extreme red being cut off, and all the blue, indigo, and violet being obliterated, except concentrated light is employed, when some of the blue rays are seen to come through. This glass would be no protection with collodion containing bromine, and very little with an iodized collodion One peculiarity of this glass (which it possesses in common with many others), is that red flowers examined through it can scarcely be distinguished from the green leaves with which they are surrounded.

No. 22. W. C.—An orange glass coloured with silver. This cuts off the violet, indigo, and blue rays in a very perfect manner, and would be quite applicable for photographic purposes. This glass is curious, inasmuch as it possesses in a remarkable degree the false dispersion mentioned by Professor Stokes. It reflects from one side when placed on a piece of black velvet a peculiar bluish green light; or when placed on a sheet of white paper the scattered light partakes of that mixture of blue and brown which is ordinarily distinguished as a puce. (Hunt.) Of this variety of glass Professor Stokes makes the following remarks:—Orange coloured glasses are frequently met with, which reflect from one side, or rather scatter in all directions a copious light of a bluish green colour, quite different from the transmitted tint. In such cases the body of the glass is colourless, and the colouring matter is contained in a very thin layer on the surface of the plate. Referring to this, Mr. Hunt, who has examined this glass, states that this is not always the case; in the glass with which the present experiments were made the colouring matter, silver is diffused throughout the mass. The peculiarity in question is produced on one surface by exposing it to the influence of the flame of burning smoke. Professor Stokes continues: as this phenomenon was supposed by Sir John Herschel to offer some analogy with the reflected tints of fluor spar, and a solution of sulphate of quinine, I was the more desirous of determining the nature of the dispersion. It proved on examination to be nothing more but false dispersion, so that the appearance might be conceived to be produced by an excessively fine bluish-green powder contained in a clear orange stratum, or in the colourless part of the glass immediately contiguous to the coloured stratum. The phenomenon has, therefore, no relation to the tints of fluor spar, or sulphate of quinine.

23. H.—A piece of yellow oiled silk has been sent by this correspondent. It would be of use to examine many various kinds of flexible media, such as horn, thin gutta

percha, india rubber, and oiled silk, either in their natural states, or artificially coloured, as if a suitable obstructing medium could be found amongst these substances, it would be a great advantage over the use of glass, inasmuch as its non-liability to break would render it an invaluable accompaniment to the photographic tourist, who might have his tent almost all window, instead of admitting the illuminating light as at present through the most jealously guarded aperture. The piece of oiled silk under consideration is, however, scarcely up to the mark, although it is better than yellow calico, or tammy. Examined in the spectroscope, considerable quantities of green light, acting on bromide of silver, come through, and a trace also of blue light when sunlight is used to illuminate the slit.

ACTION OF LIGHT ON THE COMPOUND OF FERROCYANIDE OF IRON WITH OXALATE OF AMMONIA.

BY HARRY NAPIER DRAPER, F.C.S.

When paper, which has been floated upon a solution of prussian blue in a saturated solution of oxalate of ammonia, is exposed to the action of light under a negative photographic image, those parts exposed to its influence acquire a faint blue colouration. If the paper be now washed with water and then immersed in weak hydrochloric acid, this slight impression becomes very intense. The excess of acid being now removed, the paper dried and again exposed to light, the image soon fades, but is restored by being kept in darkness.

I have not had leisure to work out any more practical results from this interesting action, but it seems possible that it might be advantageously applied in calico printing, and I have no doubt that little difficulty would be found in forming some black or dark brown iron compound on the blue surface. In this case, quite a new method of photographic printing might be based upon it.

SOME NOTES ON POSITIVE PRINTING.

BY SAMUEL FRY.*

Having gone rapidly through the details of the printing process, I will briefly consider the circumstances which may call for departure from or variation of any of the ordinary methods of manipulation. First in order must assuredly come the different character of negatives which may be operated upon, one may be a dense old fashioned pyrogallic landscape, with a sky, to the delight of some, as "black as your hat;" then a poor, weak, grey image of half tone, perfect in detail, but without high lights or any contrast of light and shade; surely these two negatives should not have their proofs produced by the same details of manipulation. Examine two prints produced from the same negative, the one by a beginner, the other by an accomplished printer; it would scarcely be credited that they were from one plate: difficult, tedious, perplexing as are the steps by which the photographer gradually acquires power over his camera and collodionized plate, I really believe that it requires more patience and practice to print properly. How often have I examined the negative of a painstaking, undaunted amateur in quest of the cause of his miserable prints, and found that the fault lay solely with his printing manipulation, the negative being of fair average quality. Some say that they cannot obtain sufficiently glazed paper, the objection is ridiculous, for some of the finest prints I ever wish to see are on plain paper, toned by carbonate of soda and gold; I can imagine nothing better suited for portraits to be framed, and therefore give the recipe.

I prefer Rive or thin Saxony paper, salt by immersion for 10 minutes in

Chloride of Sodium	1 drachm.
Distilled Water	8 ounces.

* Concluded from p. 423.

Dry by suspension at one corner, and place in a portfolio for use. When required for printing float on a bath of

Nitrate of silver	60 grains.
Distilled Water	1 ounce.

This must be kept carefully in the dark, as it is far more sensitive than albumenized paper. Over print rather more than in ordinary printing, wash out the silver and tone in

Chloride of gold...	1 grain.
Carbonate of soda	2 grains.
Water, 65°	6 ounces.

The action of the gold is most vigorous, and some promptitude is required to prevent the print becoming blue, when a rich violet is attained, wash in cold water, and place in

Hypo	4 ounces,
Water	1 pint,

and in this bath the print acquires magnificent tones, the purest pearly white, and altogether the appearance of a fine engraving on India paper. Now I do not ask any one to relinquish the use of albumenized paper, no one admires it more than I, but for many bold subjects the above process give most exquisite tones, and leave nothing to be desired.

And now to consider the relative virtues of the toning baths which have been recommended, of acetate or carbonate of soda in conjunction with gold. I much question if the former have had its fair trial, or I certainly think it would be in more general use. It has a great advantage that no spontaneous decomposition of materials takes place by keeping the mixture within reasonable limits, and therefore after use nothing but additions of gold is required to keep it in working order for use at any required time.

Chloride of Gold	15 grs.
Acetate of Soda	$7\frac{1}{2}$ drs.
Water	1 quart.

This preparation, suggested by an excellent and careful experimenter, Mr. Hannaford, in my experience gives admirable tones, and only within a few days Mr. Leake, whose portable tent for out-door work is well known, has informed me that he now uses it in preference to other methods, as giving invariably brilliant fine tones and clearness of picture, for an amateur only producing a small number of prints it seems admirably adapted.

The carbonate process, which is the modification more generally used, is simple of preparation, but requires to be freshly mixed on each occasion from precipitation of the gold. A solution of chloride of gold should be made of 1 grain to a drachm of water, and a solution of carbonate of soda of 5 grains to an ounce of water; take 1 drachm of gold solution and add 6 ounces of distilled water, and then add carbonate of soda until neutrality, as indicated by test-paper, is produced. With a given sample of chloride of gold, having observed the quantity of carbonate solution necessary to produce neutrality, the same quantity may be added with safety on subsequent occasions without the trouble of testing, but when a new sample is obtained, go through the litmus paper trial again, as the quantity of free hydrochloric acid varies with every sample of gold. Here I may observe that we have in our power a valuable agent for reducing the over intensity of prints accidentally over printed, as by adding to the solution used to tone such pictures, an excess of carbonate they may be very greatly reduced.

In gold toning but little difficulty is ever experienced in printing large sized negatives containing much detail, and with good vigour, from these plates prints are obtained such as could never be approached by "old hypo," but it is in carte de visite and stereoscopic pictures, that the difficulties of alkaline toning commence; then we see mealy red spots of untoned picture, varying from a pin point to great streaks, and in the attempt to tone them, the pictures which display these faults are almost always dull and grey from prolonged exposure to the gold; I believe these spots are caused by the unequal absorption of the paper from the inequalities of fibre. at one part the albumen rests as a little hillock on the surface, and thus dries; at an adjoining spot again it sinks deep into the surface; can these two surfaces produce the same photographic effect? Not with a rapid toning process, under the "old hypo" regime all this was unknown from the slow, gradual change of silver for gold in the process of toning, but now we do it all in a few minutes. I am free to confess that when I have been tormented with these wretched spots, my only remedy has been to get another sample of paper; this is not flattering to one's vanity, but though certain remedies proposed have lessened the evil, they have not removed it.

Alkaline toning must undoubtedly raise the quality of our negative, for it is essential that they have that contrast of tone which alone produces fine results. In my own practice I keep two sensitizing baths for different qualities of plates, one of 65 grains for ordinary good plates, and one of 90 grains for poor, weak, grey films; these latter we print on the most highly glazed paper, with the strong bath, and a weak light, and then obtain often far better result than might be anticipated.

I will conclude with two wrinkles, neither of my own origination, but both valuable. If your paper curls up when placed on the sensitizing dish, breathe on it, within two inches distance, it will go down instantly. Again, when your finished prints are dry, pour the final washing, roll them up, albumen side *out*, on a stick, in ten minutes all their inclination to curl is gone, and they become as flat as a sheet of note paper.

Critical Notices.

THE LADY OF SHALOTT. By H. P. Robinson, Leamington.

A contemporary critic recently complained that all the erse writers of our day are under the spell of the laureate, that they have got intoxicated with Tennyson, and gone reeling off to follow this new Ariel and his enchantment. "His muse and his music," it is remarked, "are alike irresistible. Some may stop their ears, and bind themselves, Ulysses like, to the mast of their own vessel: it is all in vain. The syrens draw them ashore, vessel and all, and they are wrecked. Shakespeare did not tyrannize over the Elizabethans half so much as Tennyson does over the young mind of the present." That which, however, might be a vice, leading only to feeble imitation in the young poet, may be in the artist a merit, leading to creation. It is no derogation to the imagination of the painter that he should catch his inspiration from the poet, to whose conceptions he endeavours to give pictorial embodiment, thus becoming an "interpreter in the Laureate's own House Beautiful."

Mr. Robinson is amongst those who have drunk inspiration at this fountain. His illustration of "Elaine" we recently noticed briefly, and at the same time referred to a larger and more ambitious work, rendering another scene from Tennyson. The subject is described in the following lines from "The Lady of Shalott."

"Down she came and found a boat
Beneath a willow left afloat,
And round about the prow she wrote
The Lady of Shalott.

"And down the river's dim expanse—
Like some bold seer in a trance,
Seeing all his own mischance—
With a glassy countenance
Did she look to Camelot.

"And at the closing of the day
She loosed the chain and down she lay;
The broad stream bore her far away,
The Lady of Shalott.

"Lying, robed in snowy white
That loosely flowed to left and right,
The leaves upon her falling light,
Thro' the noises of the night,
She floated down to Camelot.

"And as the boat-head wound along
The willowy hills and fields among,
They heard her singing her last song,
The Lady of Shalott."

We know very well that there are many non-photographic and some photographic readers who will smile with complacent pity at the notion of giving embodiment to an imaginative work by means of photography, and regard it as a task more difficult than "making bricks without straw." The task is difficult; and we honour the man whose ardent love of, and faith in, his art, gives him courage to attempt to realize thus the conceptions he has admired. The work must be a labour of love; there has been little honour and less profit gained hitherto by such attempts. Artists and art critics have generally been disposed to sneer at what they deem the presumption of a "servant of servants." Even those who should be authorities in matters photographic are often disposed, with a Burleigh-like shake of the head, to whisper "too ambitious;" and the applause of a few, together with that inborn gratification which makes such efforts their own exceeding great reward, are the only encouragements the pioneers in this yet comparatively untrodden walk of art receive. With our views of this subject, we hold failure in such attempts no shame, whilst we hail every success, entire or partial, with unalloyed satisfaction.

We regard it as one element of success in this picture that Mr. Robinson has caught much of the spirit of mystic solemnity which characterizes the poem. The background of fine old willows, whose branches and foliage, interlacing and overhanging the stream, almost shutting out the light of day, are reflected in the water, pre-Raphaelite in their detail, yet communicating an effect of sadness, sympathetic with the spirit of the incident. Without analyzing his sensations or ascertaining their source, the beholder is impressed at once with a similar sensation of undefined gloom to that conveyed by the poem. Extended in the boat with dishevelled hair and glassy countenance, the "lady" bears out the same idea.

But for two or three faults of detail, which mar the picture on submitting it to critical examination, we should have regarded this as the finest imaginative photograph we have seen. A photographic contemporary has described it as lacking "poetic grace," observing that "this is not the lady for whom the knights came riding two and two.'" We fancy there is some odd misconception here; poetic grace, we imagine, is not exactly the idea intended to be suggested; the whole idea of the poem is gloom, mischance, and sadness, together with an all-pervading mysticism. Not for her come the "knights riding two and two," any more than for her come the

"troop of damsels glad,
An abbot ambling on a pad,
Sometimes a curly shepherd lad,
Or long-haired page in crimson clad."

It is declared that "she hath no loyal knight and true," but is a picture of desolate loneliness. Poetry there is in the picture, but it is certainly not, nor should it be of a graceful character; gloom is rather its chief suggestion.

There are, as we have said, some few faults in the picture, but these are of a quality which detract rather from its truth than from its imaginative beauties. A gentleman of much taste remarked, of it to us whilst examining it in the Manchester Exhibition, that "the boatlooked somewhat wooden." Of course a boat is wooden; but the remark was suggestive of the fact that the character which should indicate the form rather than the material, was absent. From under-exposure, we presume, the reflections which should be thrown by the water on the underside of the boat are not rendered, and the only means of showing its form are lost, the effect being of a flat profile, rather than the convex lines of a boat. Much more detrimental to the truth than this, however, is the absence of any appearance of motion. A boat gliding, however gently, down the stream, would in dividing the water cause slight eddying wavelets, which catching the light would at once give some effect of life and motion to the water. The broad leaves of the water-lily, would in like manner, slightly disturb the glassy smoothness of the surface, causing little rippling circlets and undulations, with light glancing from their rising edges. These ripples and eddies would disturb the perfect form of any reflections in the water. Here, however, the boat is reflected almost as perfectly, as regards form, as in a mirror. We presume the fact is, the boat was taken in still water, and when quite motionless; but if we were hypercritical, we should say it has almost the effect, from the boat not being sufficiently deep in the water to suggest the idea of floating, and from the cause we have named, of being laid on to a mirror rather than floating in water. The dim twilight effect of the close of a dull day is well preserved generally, but is slightly marred by the too vivid patches of light on some parts of the river.

There is another point in which Mr. Robinson has missed somewhat the spirit, and even the letter of the description. The idea conveyed in the poem is of entire abandon.

"Lying robed in snowy white,
That loosely flowed to left and right,
The leaves upon her falling light."

In the picture we have not the snowy white robe flying to left and right; a little white drapery is to be seen gathered closely round her bosom; but the figure is well covered and "tucked in" with some dark damask drapery. This may contribute to the effect of the picture in one sense, but it detracts from the truth of the description, and destroys the idea of abandon conveyed in the drapery flowing to left and right, with the falling leaves scattered lightly upon it. At present the dark drapery is almost necessary to relieve the figure against the light on the water; but we imagine the effect might have been much finer, if it had been so managed that the figure was the sole focus of light; the river, as well as all the accessories being kept in shadow or half tint.

It will be observed that we criticize this picture rather as work of art than as a photograph. Such pictures demand a high standard of criticism; and we unhesitatingly say that we have known many Academy pictures obtain much praise that had not a tithe of its merit, either as regards poetry or truth. As a whole we regard this as a noble picture: it is finely conceived, and for the most part well worked out. Had we admired it less as a work of art, we should not have cared to criticize minor faults, and it is only because the picture is so fine in other respects, that these faults of detail are worthy of notice. Mr. Robinson aims high, and often succeeds well, and we shall look with pleasure for more in this direction rom his hands. The production of one such photograph we regard, however, as sufficient to stamp a man an artist, and his work fine art. The picture is about 20 inches by 13 inches, and is, we understand, from three negatives. For the most part the photography is excellent.

THE ART CLAIMS OF PHOTOGRAPHY.

[We have selected from the various replies to "R. A." on this subject, four letters, from what may be termed "representative men." The first, M. Claudet may be just regarded as, in a double sense, one of the first photographic portraitist in the world. The second is from an artist, that is a painter; the third from an amateur; and the fourth from an operator. Other correspondents who have written on this subject will see that their arguments are already employed in the letters given, and that our space precludes mere repetition.]

Barbarus ego sum, quia non intelligor illis.

Sir,—In a recent number of your journal a correspondent under the initials of R. A., taking for epigraph "audi alteram partem," has endeavoured to prove in a letter more elegantly written than logically thought, that photography is not a *fine art*, that the Commissioners of the Great Exhibition have acted wisely and justly in classifying it in the mechanical department, and that the Photographic Society has assumed very absurd and preposterous pretensions in daring to take up the dignity of the body it represents.

The point in discussion rests entirely on the sense which ought to be given to the term *fine arts*, and as in all discussions the main thing is to agree upon the meaning of the words employed, let us first endeavour to determine that important question.

The expression *fine arts* appears to be of very recent introduction in literature. In Johnson's Dictionary there are many paragraphs devoted to the various applications of the word *art*, but not the least allusion is made to the term *fine arts*.

The "Dictionnaire de l'Academie Française," is not more explicit. The word art is expounded in various acceptations, but there is no mention of *Beaux arts*. The "Dictionnaire universel de Bouillet," Paris, 1854, has the words Beaux arts and explains them thus:—"*Beaux arts*, on réunit sous ce nom tous les arts qui ont pour but de charmer les sens par la culture du beau, les arts du dessin (peinture, sculpture, gravure, architecture) la musique, la danse."

"Crabb's Technical Dictionary," London, 1851, does not give the words fine arts, it merely distinguishes the liberal arts from the mechanical arts, and has—"*art*, from the Latin *ars*, and the Greek *aro*, to adopt. The contrivance and disposal of things by help of thought and experience, and according to prescribed rules. The *liberal arts* are those which are noble and worthy to be cultivated without regard to the lucre which they may bring, such as architecture, grammar, music, painting, poetry; and the *mechanical arts* are those wherein the hand and the body are more concerned than the mind, which are followed for the sake of the gain that accrues from them."

Maunders' "Scientific and Literary Treasury" has:—"*fine arts*, a term somewhat indefinite in its meaning, but generally applied to those arts which depend on the mind and imagination, opposed to *mechanical*."

Maunders' "Treasury of Knowledge" defines *fine arts* thus: —"The arts which are the growth of taste and refinement, as poetry, painting, &c."

According to Bouillet, if the *fine arts* are those which have for aim to charm the senses by the cultivation of the beautiful, such as the arts of drawing (painting, sculpture, engraving, architecture), music, and dancing; surely photography so highly capable of cultivating the beautiful, ought to be classified among the fine arts.

If, according to Crabb, the liberal arts are those which are worthy to be cultivated without regard to the lucre they may bring, in this exalted point of view, is it not right that photography, practised by royalty and aristocracy, should be ranked among the *liberal arts*, and not among the mechanical arts, wherein the hand and the body are more concerned than the mind? Certainly the scientific art of photography, in which the mind, thoughts, and taste, have so much to do, cannot be called a purely *mechanical art*.

If we adopt the sense given to *fine arts* by all the above authorities, this sense seems to mark pretty clearly the place belonging to photography. We must at the same time acknowledge that among the arts called fine arts, there are some which are much nobler, more perfect, and more refined than others. No one will pretend that engraving and dancing require as much thought, genius, and knowledge, as poetry, painting, and sculpture; still it is generally agreed that *engraving* and *dancing* are sisters to the *fine arts*. Why should the younger and promising sister, Photography, be repudiated or scornfully treated by her elders, who have so much to learn from her, and who have received already at her hands more than one useful lesson.

The ancients in their mythology had personified the arts. Nine Muses represented the various forms under which the mind exercises its most refined aspirations and charms by its intellectual power. Apollo, the god of all the arts, was the patron of the muses, and he changed the ears of Midas into those of an ass for having dared to suppose that Pan was superior to him in singing and playing on the flute. A great lesson, that we must not forget in the fear that our ears should suddenly expand into an unenviable dimension, and even photographers would well deserve the punishment if they had the imprudent audacity of putting their art above or on the same level as painting and poetry. Their pretensions are more modest, although dignified. Photography, born the last, claims a seat, at least a stool, in the temple of the *fine arts*.

How is it that the ancients had no muse either for painting or sculpture? In the primitive ages were painting and sculpture classified in the mechanical arts, as considered not deserving to be admitted in the great temple consecrated to the liberal arts? If it were so, photography in its infancy should not complain of a similar treatment. But let us try to find a more natural cause for the omission.

It must be supposed that the arts of painting and sculpture were flourishing only long after those which were personified by the nine muses. This supposition is very plausible when we think that poetry, history, tragedy, music, dancing, lyric poetry, singing, rhetoric, eloquence, and astronomy, must have been the first refined occupations of the mind. Men thought, spoke, loved, sang, danced, recorded past events, imitated terrible and mimic deeds, before they were led to imitate natural forms by cutting stones or modelling clay. Painting, more complicated and difficult than sculpture, was the result of a higher state of civilization. It required the invention of various pigments, a considerable skill in their proper application, and much judgment in the appreciation of the effect they produced.

Before painting was sufficiently perfect to be considered as an art, ages were to elapse in total ignorance of its powers. Painting came long after the epoch when men, being congregated in society, turned their thoughts towards a system of religion, when in their ignorance they could not do without a distinct God, supposed to superintend every separate work of the creation, to regulate every branch of human intellect, and to watch over each of their individual wants. Then we can understand why mythology did not include painting and sculpture in the arts represented by the Muses, for these arts had not yet been discovered or recognised.

Therefore, the fact that painting and sculpture in those times had no patrons in mythology, cannot in the least make us believe that these two beautiful branches of the *fine arts*, had been discarded in the estimation of pristine society. The ancients merely were as much ignorant of the capabilities of the mind to embrace the powers of sculpture and painting, as subsequent civilizations, when these arts had been flourishing and acknowledged as branches of the *fine arts*, were ignorant of new branches which science and the wants of a more advanced state of society were to create for the improvement and enjoyment of mankind.

Painting and sculpture for ages had no seat in the temple of the arts, would they now illiberally in their trumph, forgetting their long abandonment, refuse to photography the rank in the *fine arts* generally accorded to engraving and dancing.

Royal Academician (as I interpret your initials R.A.), don't be too proud and exclusive, photography deserves your respect on account of its noble and marvellous origin, and your gratitude for the services it has rendered and is destined to render to all the fine arts. Be just towards the sister art, who is the great teacher for all, who accustoms the eyes of the public to discern what is correct and what is false in composition, drawing, and perpective. Has it not been observed that since photography is constantly infusing in all classes the taste for artistic knowledge, the visitors of picture galleries are now readier to notice in the works exhibited the least fault of proportion, which before they would not have been able to detect. Photographic productions are in the hands of every one, and the eyes accustomed to their *mechanical* truth, even if they do not contain the higher qualifications of which they are susceptible, become more and more difficult and competent judges.

You ask—Is photography properly an art or a science? and you grant that to a *certain extent* it is both, although more properly the latter than the former. I answer that if it is more a *science* than *an art*, it does not prove that it is *not an art*; on the contrary, the science enhances the art, and from that singularly fortunate union, is derived in the fullest acceptation of the words a liberal art and *fine art*.

One of the strong arguments by which you attempt to lower photography, is that it depends from first to last, for the production of results, upon a series of chemical reactions. That the tyro in photography is recommended first to gain some knowledge of chemistry in order to attain excellence in his operations. This is perfectly true, and I may add that the tyro in painting or sculpture need not trouble his head to endeavour to acquire much scientific knowledge; but a little reflection will show that a complete study of chemistry would be exceedingly useful to the painter, to teach him how to make his colours, and use them according to scientific principles, so that by the laws of affinity they should not act injuriously one upon another, or be affected by the persisting action of the gases mixed with the air, and by all other meteorologic, hygrometric, calorific and actinic influences. Another difficult study, that of optics, would enable him to understand thoroughly the laws of perspective and proportion of objects according to their distances; the principles of binocular vision as they were comprehended and explained by Leonardo Da Vinci, showing that as pictures are painted in one perspective (that given by a single eye) they should be examined only with one eye in order to present to our perception, in a greater degree of truth, the natural effect expected in the picture. The singularity of this fact is not understood by all eminent painters, and while conversing with them on this curious question, to my great surprise, I have found many denying the truth of the assertion, or not having the least notion of its meaning.

However, the painter without the least knowledge of chemistry, relying for the production of his pigments, upon the honesty and science of others, and without knowing the principles of optics, is still capable by following empirical data to exercise his genius and artistic taste. The photographer has not the same advantage, he cannot realize any intellectual conception, his mind has no power, and as the poet says,

Pour lui Phœbus est sourd, et Pégase est rétif,

if his chemicals are *out of order*, his lenses and camera in *bad condition*, or unscientifically regulated.

The necessity for the photographer to acquire many difficult and complicated sciences, do not exempt him from gaining artistic knowledge. But he has to be proficient in the *mechanical art* of photography before he can think of becoming proficient in the fine art of photography.

All the various applications of the *mechanical art* of photography can, in a greater or less degree, exercise the genius, the taste, and judgment of an artistic mind, but it is in the application of photography to taking portraits that there is room for the greatest effort of intellect, and the greatest display of talent.

The portrait photographer must in the shortest time possible place his sitter in a natural and graceful position, without the least appearance of affectation. He must see at a glance the best arrangement of the dress and draperies, avoid hard contrasts in their colours, light the head and the whole body in the most favourable manner.

Hæc amant obscurum volet hæc sub luce videri.

If some features are imperfect, a certain position given to the head may improve the effect. He has to attend to the expression, and while conversing with the sitter, to discover and seize the moment when the eyes and mouth appear in repose, and express refinement.

The photographer who understands his art has to hide all the defects, and to show more pre-eminently what is beautiful and perfect; in one word, he has to compose, as much as possible, a pleasing picture, and if he be a real artist, he can generally succeed in the attempt, at all events if he fails, he will never show the result, proving by the concealment of the bad, as much taste as by exhibiting the good results.

Will you deny that the photographer who can produce pleasing and artistic portraits is not practising a fine art? No, you say yourself that you have seen many *photographs perfect gems of art*, and thus photography in the hands of a true artist may often yield results worthy to be *classed as works of fine art*. But you add all this is due to the man, not to the method. Is it not the same in painting, in sculpture, in any art; are the gems due to the man or to the method? Do you pretend that every work produced by the methods of painting and sculpture are works of fine arts? I say, that the greatest number are rather works of ugly art, than works of fine arts. So it is in photography, and more than in any other art. But can there be anything more horrid than bad painting and bad music? Because, as you have observed very rightly, there is not one per cent. of those practising photography who have any claim whatever to the name of artist, or who have had any art training or education; you conclude wrongly that photography is not a *fine art*. What strange aberration of reasoning! Because not one in a thousand who sing, dance, and use a musical instrument, have not the least notion of the arts of music and dancing, does it follow that music and dancing are not *fine arts?* Because not one in a thousand (I do not exaggerate) who paint in oil or water colour, or draw in crayon, have the least knowledge of perspective and drawing, and know anything concerning the right application of colours, does that prove that painting is not a *fine art?*

How can you impute it as a reproach to photography that those claiming the name of photographic artists have left the farm and the merchandise, and even less dignified callings, to take up the camera? Among them you willingly admit the existence of many men of eminently artistic capacity and taste; but those again are the exception, not the rule. I admit the truth of your assertion, and I deplore the fact more than you can. The generality of those who claim the name of photographic artists indeed are uneducated and incapable of producing results with the least feeling and taste. But whose fault is it? certainly not that of photography. It is the fault of the public who, not understanding or caring for what is good and what is bad, encourage the libels on the "human face divine" by giving occupation to those inept and vulgar workers at photography. But has not this been always the case? before photography, did not the same ignorant and barbarous public give work to those painters who were a disgrace to the art? This cannot be helped; and, besides, is it not in some respects fortunate that the poor could have his photographic portrait for sixpence? The humbler classes do not care much about refinement in art; they are satisfied with a likeness which at all events has a certain degree of correctness, and is far superior in truthful individuality to the portraits executed at some expense by very inferior miniature portrait painters.

What is the conclusion of all this discussion? If you have not proved that photography in the hands of men endowed with taste, feeling, and refinement, cannot produce results which charm the senses, by representing what is beautiful in nature—that they cannot stamp their works by some effort of mind—you have failed in your attempts to disparage photography, and to repudiate it as one of the *fine arts*.

The great cause of misunderstanding and confusion in this discussion is, that when one speaks of *fine arts*, one thinks only of such names as Raphael, and Michael Angelo, and he forgets that there has been produced, and are produced, disgusting paintings by the same art, and by the same method employed by Raphael and Michael Angelo. In speaking of *fine arts*, one thinks only of Poetry and Painting, but one forgets that there are some humbler arts which are also called *fine arts*. Photography, the accomplished daughter of Science, may enter in the circle of the Muses, between engraving and dancing, as far as you like of painting and poetry. But she must be in the circle.—I am, sir, your obedient servant,

107, *Regent Street*, 11*th September*, 1861. A. Claudet.

AN ARTIST'S REPLY TO R. A.

Dear Sir,—For an evidently prejudiced man, your correspondent "R. A." displays no little candour and good sense. I am heartily glad to find his letter in my "this week's News," because I anticipate that so clear a statement from one side will not fail to meet with a no less clear refutation—either from yourself, or from some of your able and excellent writers on photography as a fine art. Without venturing to anticipate such able friends, I should nevertheless like to add my mite of a contribution on the subject.

In the first place I willingly admit the facts R. A. advances as indicating the hitherto general recognition of photography as purely scientific. I know very well that the art *does* depend "upon a series of chemical reactions,"—that the education of the photographer for its professional practice *is*, from beginning to ending, avowedly scientific—that artistic failures are almost entirely ignored; and that the only failures generally recognized are those due to defective chemical, optical, or manipulatory conditions. I know also that all our accepted authorities are great in the scientific rather than the artistic, that while the dictates of eminent artists have been pooh-poohed at the meetings of societies, the veriest tyro in science has claimed a respectful hearing: nor am I going to deny "that the professional photographer generally relies for success upon the purity of his chemicals, the perfection of his lenses, and his skill as an operator." But admitting all this, what on earth has all this to do with the question in hand?

If brushes and palettes constituted a fine art in themselves, then R. A. might say photography is not a fine art, because its productions are obtained by the use of no such things. If the education of the photographer is purely scientific, this fact *itself* accounts for the want of artistic qualities in his productions, and is far from an argument against the art's want of artistic capabilities. If only one class of failures are recognized, while, as R. A. admits, others exist, it is evidence against the professor and not against his art. If all our accepted authorities are great in the scientific rather than the artistic, R. A. must remember the art is based upon a science, and that its first and most urgent necessities arose rather from scientific than artistic shortcomings. In short, if R. A. wants to *prove* that a certain branch of science is not capable of being cultivated as a fine art, he must do something more than show that it has not, up to the present time, received its fair share of such cultivation.

In the next place R. A. asserts that the various degrees of merit shown by photographs do not prove photography to be a fine art, because such differences may be found in the productions of arts purely and avowedly mechanical. Very true; but neither do such differences *dis*prove the claims of photography to a position among the fine arts: while, if it is shown that such differences can to a very large extent be traced to the presence or absence of intellectual artistic acquirements, rather than superior appliances, or different degrees of mechanical ability, I then think such differences *do* certainly go a long way in proving my views of the matter.

As to the mirror illustration, and the insinuation that the photographer has no more right to be called an artist, because his silvered glasses reflect and retain the images of nature, than the man who silvers the glass of a mirror to perform a similar feat,—pray, will not the same argument tell against every branch of imitative art, and deny the title of artist to Claude, Raphael, Wilkie, and a host of other great painters, including all the fine masters of the Dutch school, whose works are as strictly imitative as those of the photographer? How many a great painter has yearned to depict a beautiful scene with all the fidelity of a mirror; but did this prove him no artist? Did Shakspeare recommend the actor to "hold the *mirror* up to nature" because he would thus *degrade* his art, or because truthfulness was its loftiest quality? Truly, R. A., I do think you are grievously wrong in your arguments against the position claimed by one of the greatest and most wonderful powers of our great and wonderful age.

Now the reluctance with which the claims of photography, as a fine art, are met, seems to meto be due not to any want, or defects, or peculiarity of the art itself, but rather to the loose indefinite ideas associated with the term, "Fine arts." The word "*Art*" undoubtedly has a wide significance; we understand what such a word means, and know, that although it excludes numerous branches of subordinate industry, it still embraces a vast multitude of trades and callings associated with civilization and intellectual advancement. But when we pick out certain arts and call them "*fine*," pray what new significance do we derive from the appending of this last unmeaning word? "Oh!" says one "it means painting, sculpture, architecture, poetry, and music." "No," says another, "it only means painting and sculpture;" and "no," again says another, "it means painting and poetry." Who shall decide? the term *itself* signifies nothing at all, and we can only define an art by its conventional and descriptive title, when it embodies such demands as are responded to by other arts to which such a title is universally awarded. Judge photography *thus*, and it is a fine art. I leave the elaboration of such arguments to more able hands, and am, dear sir, yours obediently,

September 7th, 1861. R. A. S.

AN AMATEUR'S ANSWER TO R.A.

Magna est Veritas et prævalelit.

Dear Sir,—It seems the prevailing idea among the depreciators of photography, that it aspires to the highest place among the arts, and that if it can be shown to be wanting in any of those fine qualities that dignify its sister arts, it falls entirely out of their sphere. Your correspondent "R. A." is conspicuous in the foremost rank of these assailants, and in debating the question, how far photography is a fine art, appears to lay great stress upon the assumption, that its followers exhibit great ignorance, not of the principles of light and shade, nor in the art of grouping their figures, nor in the general composition of a picture, but in the knowledge of the mind of man and his motives, and in winding up his dissertation he again and again triumphantly puts the very pertinent question, Do photographers show a knowledge of human nature?

But as in the arts one requires different qualifications from another, so in each there is room for the exercise of different kinds of talent. A man may establish his claim to be a poet by a sonnet or ballad as well as by an epic poem. The translation of Homer called forth powers of a different kind to those exhibited in the composition of "The Rape of the Lock," but either production would have secured to its author a high place in the Temple of the Muses. So with music, a composer takes the first place, but the performers of his works, whether vocalists or instrumentalists, may be artists also, nor does it invalidate the claim of the latter to the title, that he is dependent in a great measure on the mechanical excellence of his instrument for the beauty of the performance, nor would it alter the case if he constructed his own instrument. Granted that a knowledge of chemistry is essential to a photographer of merit, is not an acquaintance with anatomy requisite for a painter or sculptor, and even with this he calls in other appliances to his aid? Does anyone suppose that the figures in the group are dashed off from the teeming brain of the artist without careful and often servile copy from a living model? Is not chemistry invoked to produce and render permanent the colours of the painter, and is not digital dexterity needful in laying the colours on the canvas? It is true that the photographers is bound by more than ordinary strictness to his subject, but nature may be viewed in as many different aspects as painters view their models, and the result in either case would receive the "impress of the mind of the artist."

But is it reasonable or manly to lay such violent hands on infant photography, of giant growth though it be? While painting can count its age by hundreds of years, photography can number but units yet so great has been its progress, that people think nothing beyond its reach, and quarrel with its tardiness in reaching perfection. Good people, have as much patience as the artist who labours untiringly through more difficulties than you dream of. Though our pictures have no colour yet the advance of our art hitherto promises it. Though iodine and bromine have not yet yielded up their secret treasures, has not fluorine given ray for ray to the searching developers, and what photographer does not look forward with confident expectation to the time when his pictures will glow with nature's own tints, which though snatched somewhat rudely will not be an unwelcome exchange for those gaudy and tattered garments of conventionalism with which the necessity of her needy admirers have hitherto clothed her.

Surely, sir, in this age, those who wander side by side through the paradise of nature ever intent on finding and securing those beauties which will lavish hands, she has for all and to spare, ought to be more liberal to each other than to assert that because one art attains its end by particular means, any other process is disqualified from sharing the honour with it. The remarks of "R. A." amount to this, "You must not use a lens and chemicals, but you must use a pencil or a brush; it is of no use that you are a skilful manipulator, but you must be dexterous in the use of your pencil; and although it be true that the lens and chemicals *will yield in the hands of a true artist works worthy to be classed* with those produced by the pencil, this merit being *due to the artist and not the method, i. e.* independent of the means employed, yet *you* must not be independent, and use your lens, but use your pencil as I do."

However loth photographers may be to succumb to this conclusion, the most enthusiastic will not differ from R. A's. premises. Perhaps we should agree still more with those whose sentiments R. A. represents, did they recognise more fairly the difference, not in degree, but in kind between good and bad photography. They expect this treatment from their opponents, if indeed we are to be so termed, and would loudly exclaim no doubt against the injustice of their art being held responsible for the quaint inventions of the sign painter.—Yours truly, M. A.

AN OPERATOR'S ANSWER TO R.A.

Sir,—In a recent number, I noticed a letter (The Art Claims of Photography), upon which I wish to offer some remarks, if I may be permitted to do so.

As your correspondent "R. A." seems to despise photography in connexion with fine art, let him know in the first instance that it is useful, I may say necessary, to a great many artists. Could the paintings in the forthcoming Exhibition speak for themselves (I do not mean any harm), we should soon know how many of them have been got up without the aid of photography.

I will now go further, and touch upon the invidious distinction drawn between painted portraits and photographic portraiture; the former "R. A." calls fine art, the latter he terms what? why "the very apotheosis of the common-place and vulgar."

Where "R. A." got his notions is more than I can tell, but he must be the son of a genius (or perhaps a genius himself) to adopt such a flowing style, and has every right to rank as belonging to fine art.

The inconsistency of his remarks is, however, easily proved by a single glance at the hundreds of cartes de visite now extant of the most remarkable and leading men of our day.

We will now examine the difference existing between the two styles of portraiture; at the outset there is one point on which I must agree with "R. A.," he is certainly correct in saying that chemistry is a science, and cannot be called art; hence it follows that neither the theory of colours, nor the effects produced by their contrast, or by their harmony, (so beautifully illustrated by Mr. Chevreuil, chemist at the dye-works of the Gobelins), can not be called art, ranging as they both do within the science of chemistry.

Art consists then in drawing lines, and in the application of black and white pigments in certain places to produce lights and shadows.

We must then infer that a portrait painted in sepia, or white and black, has the same merit as one painted in colours, and is quite as artistic in every point of view.

The painter adopts certain means to obtain a desired result.

We photographers adopt other and different means, but the study of light and shade, the pose effects, draperies, etc., require in both, the same skill and artistic talent. We do not, and ought not, to regard the means employed in obtaining such a result, so long as they are not purely mechanical.

The camera-obscura has long since been employed by eminent artists; science discovered the means of fixing and producing the picture which the artist used to copy from the ground-glass to transparent paper, doubtless a severe blow was thus dealt to many, especially to those always unwilling to acknowledge progress; some were deprived of the prospect of future reputations, others even of their livelihood, and I can understand to a certain extent why photography is despised by those who have thus suffered.

I nevertheless contend that a good photographic portrait possesses the same merit as any other, and I do not see why a portrait painted on canvas should rank among specimens of fine art, while a life-size photograph, far superior in every respect, should be classed with a roasting-jack or a knife-cleaner.

Photographic landscapes are literally copied by artists, and with the introduction of a figure or two, painted in water-colours, and exhibited as works of fine art. Surely no further comment is needed on this portion of our subject, enough has been said to vindicate the superiority of photography.

Next comes composition; on this subject I will be very modest, as you will acknowledge when you learn that I intend seeking composition, not only in Rejlander, but even in the humble stereoscopic slides, how many little gems do I find amongst them. I have seen hanging on the walls of the Royal Academy, groups or composition not to be compared with them.

But after all we belong to the progressive school, what do we want with composition?

Cannot we take instantaneous views,—man in the act of falling, horses galloping, clouds, waves, multitude, or masses, with the right expression on every face, joy and sorrow, tranquillity and agitation, to say nothing of celestial bodies; what more do we require? How can all this be successfully depicted save by the aid of photography?

Again it is said photography cannot modify, cannot imagine, cannot create. We do not want to modify, nor create, nor imagine; our art is not rich in deception or illusion, our aim is to study and to copy nature.

Fine art of the present day does more than modify, it transforms according to the pride of the person who pays for his vanity.

The Raphaelite school, the most true in proportions, is forgotten by many modern artists.

Certainly photography has its caricaturists, but has not fine art also its worthies with whose productions Jones's auction-rooms and others are crammed every week? I do not make comparisons in an offensive or insulting sense, but merely to show that people who despise photography on account of the vulgarity, have looked only on one side of the illustrative shield, and that photography, although strangely mutilated, ought not to be looked upon with such contempt and indifference by those who have reason to encourage it as a science and art.

Then again it is said, leading men in photography are not artists, they are chemists, mathematicians, &c. We know that photography is an art combined with science; science is the leader of all improvements, thanks to scientific men, photography has in a few years made considerable progress, and by becoming popular has imported to a certain class of people more real knowledge of art, than fine art has done in centuries. Photography has by its faithful reproductions made people intimate and familar with all that is beautiful and grand in nature.

What would have been the result if leading men had been like your correspondent, the slaves of fine art? Why photography would have remained stationary; artists contented with the comera-obscura, relying on their skill to copy the image given on the focussing screen, would have found the early daguerreotypes sufficient to convey their ideas to paper or canvas.

We must certainly admit that there is less selfishness in science than in fine art.

If scientific men have found a mean of drawing by light, with the aid of talented men, more correctly than any artist (whoever he may be), with all his brushes and pencils, then I exclaim that science has done for fine art what the steam locomotive has done for the old mode of travelling.

Is it not plausible, rational and just, that photography, connected so closely with nature in scientific researches and all artistic combination, should rank with fine art, rather than be termed mechanical, and classed as such?

Let the Commissioners be very particular in admitting only what is really *good* and *artistic*, and I think gentlemen of fine art, like R. A., will have nothing to fear about vulgarity; and unless such course is adopted, I think, for my own part, that it will be better for any photographer really possessing some artistic notions, to retire from the field of competition, whatever may be the consequence.

Let those who think photography purely mechanical exhibit some specimens taken by their own process.—Apologising for the trouble, I am yours, obediently, H. A. B

London, 11th September, 1861.

British Association for the Advancement of Science.

THE PANORAMIC LENS.

[We have received from Mr. Sutton the following authentic MS. of his paper on the panoramic lens, read before the British Association, on Thursday, September 5th, in Section A.]

The lenses commonly used by photographers for taking views have two grave defects, viz., they give curvature to lines at the margin of the picture which ought to be straight, —and they include too narrow a field of view for a large and important class of subjects. In a paper which I had the honour to lay before the British Association at the meeting in Aberdeen two years ago, I described a symmetrical triple combination of lenses, which was intended to remedy the former of the above-mentioned defects. That combination has been found to answer the purpose, and is now manufactured by Mr. Ross, the celebrated London optician. I now beg to lay before the meeting another and a very curious lens, which remedies the latter of the defects named, and produces an optical image which includes an angular field of 100° and upwards, in perfect focus to the extreme ends of the picture. This lens, which is an entirely new optical instrument, unlike anything else, I have called a "Panoramic Lens," and will now describe.

Imagine, in the first place, a thick spherical shell of glass, having its internal spherical cavity filled with water, and then, since the entire sphere is not required, imagine a central zone of the glass shell removed, and its place supplied by the brass mounting of the lens.

When the above arrangement is fitted with a central diaphragm having a small central aperture, it is evident that the pencils of light which pass through it must be incident perpendicularly upon each of the four surfaces, and therefore there is no such thing in this lens as an oblique pencil, and the errors due to oblique incidence are completely avoided, and the image formed in every part by direct pencils.

The glass shell, being a lens with concentric surfaces, acts as a concave or diminishing lens, and has positive focal length: while the central sphere of water acts as a convex lens, and has negative focal length. The medium having the *highest* refractive and dispersive power, is therefore made into a *concave* lens, while the medium having the *lowest* refractive and dispersive power, is made into a *convex* lens. It is possible therefore to render this compound achromatic by giving a suitable radius to the inner surface of the shell. The investigation is extremely simple, and the practical result very neat and convenient. It turns out that when light flint glass is used the lens is achromatic when the inner radius of the shell is about one half the length of the outer radius. The combination may properly be called a symmetrically achromatized sphere. It is a valuable property of a sphere achromatized in this way, that its focal length is greatly increased, so that a large picture can be taken with a tolerably small lens.

The central diaphragm is another curious part of this instrument. It is evident that if it were merely furnished with a central circular hole, the sides of the picture would be less illuminated than the centre. To meet this inconvenience I have made the central hole elliptical, and have placed in front of it two upright thin partitions, radiating from the centre, and looking like the open wings of a butterfly. These stop some of the light of the central pencil and make it cylindrical, and at the same time they make the side pencils cylindrical also, and of the same diameter as the central one. This simple contrivance answers perfectly in equalizing the illumination, and will be understood by examining the lens which I have sent for inspection.

The image of distant objects, formed by a panoramic lens, lies upon the surface of a sphere which is concentric with the lens. But the objects of an ordinary view are not all distant ones, for the objects upon the ground are generally much nearer to the lens than those upon the horizontal line. It is found, therefore, in practice, that the best form of focussing screen to meet the majority of cases which occur in practice, is a part of a cylinder having the same centre as the lens, and including about 30° below and 20° above the horizontal line. The panoramic picture therefore includes about 100° in width and 50° in height. The upright lines are straight, and the perspective strictly correct in all parts of the picture.

Collodion pictures are taken upon curved glasses, and the negatives printed in a curved printing frame. I have not found any more practical difficulty in working upon curved than upon flat glasses. Everything goes on in the usual way, and the various operations do not occupy more than the usual time.

I am in hopes that the panoramic lens will meet a great want which has long been felt by photographic artists in taking views of natural scenery, since it includes quite as much subject as an artist ever requires in one picture.

I have sent for inspection a complete set of panoramic apparatus, manufactured by Mr. Thomas Ross, and also a negative upon a curved glass, including about 100°, and a print from the same. Thomas Sutton.

NEW DRY PROCESS.

We find in the *Photographic Notes*, which quotes the *Melbourne Argus*, an account of what is termed a *new* dry process; but it appears to be a modification of Dr. Hill Norris's gelatine process. The specimens which were shown to the Melbourne Photographic Society, at a meeting of which the process was described, are described as very good, and bearing favourable comparison with others taken in wet collodion, The following is the description given by Mr. G. M. Hardess, to whom the modification is due:—

"I use common glass—that which is generally known as flatted sheet—which I clean with a strong solution of caustic potash and rotten-stone, freed from all grit. The plate is then well washed, dried and polished with some old collodion. I have used the same plate several times, but have seldom found stains or dirty markings therefrom. The plate is now ready for coating with collodion. I have used collodion of all kinds, sometimes very old and dark coloured from free iodine, but I certainly would not recommend such to be used in general. The collodion should be the best for the purpose, made expressly for a dry collodion process. That which I am using at present is made from good ether and alcohol, of the proper specific gravity, the pyroxyline being the best I could obtain. I iodize with cadmium and calcium, using with these either the bromide of cadmium or ammonia. I have used various proportions, but have not, I regret, been careful to mark the results. For landscape, however, I find generally a third of bromide best. But the iodizing might be left to each operator's judgment. The collodion being poured over the plate, it is sensitized in a nitrate bath of 30-grs. of silver to the ounce, and slightly acidified with acetic acid; when taken out of the bath it is well drained upon white blotting-paper: when well drained, the plate is washed for a few seconds in distilled water, drained, and it is ready for the dry solution, which is made as follows:—Take 20-grs. of Nelson's patent gelatine, soak and dissolve it in 3-ozs. of distilled water (it will be necessary to use heat to dissolve the gelatine); then add ½-oz. of white crystallized sugar, or, better still, pure white sugar-candy. Now take 1-oz. of albumen—the white of a newly-laid egg is sufficient—beat it up, and add two or three drops of liquid ammonia, and when beaten add 2-ozs. of distilled water; mix the two solutions together, and filter sufficient for use through filtering paper; pour it over the plate, drain, and dry, either by spontaneous heat or otherwise. The plate is now ready for exposure—the time will vary much with the power of the light and subject, varying from 90 seconds to 10 minutes, or more. I have used generally an ordinary view lens—Lerebour's—and ½-in. diaphragm. When sufficiently exposed, the plate is washed with water and developed with pyrogallic acid and silver. The development is generally rapid; it is then washed and fixed in the ordinary manner. Failures will doubtless be found, but by careful manipulation and pure chemicals, the failures will be but few."

TESTING COLLODION AND THE BATH.

Photographers who have had considerable experience know that success in making collodion pictures depends upon a great variety of circumstances, and that to control all these requires a great deal of wisdom and executive tact. When everything is in perfect order nothing is easier than success,—a failure is rather a freak of chance. But when one condition of success in a dozen is not present, in what a maze is the miserable befogged tyro. To him a miss is as good as a mile; to him the one screw loose is invisible. How he fumes and rages—to no purpose; he imagines Satan in the collodion, then in the bath, developer, and fixing; he is ready to pitch all out of the window, and finally perhaps himself also. Those who tried to practise the collodion process about the year 1853, will remember such a picture as this was an everyday possibility.

Photographers, however, who have had an experience of many years, have learned how to master the little difficulties which so much bothered them at first. They avoid them by force of habit, almost instinctively, and wonder how it was that they were bothered so much at first.

The most serious and perplexing difficulties with which the practical photographer is obliged to grapple, reside in the collodion or the bath, or the want of congeniality of one with the other, or a complication of all these troubles. And what makes such cases often exceedingly harassing, is the uncertainty as to the locale of the disease. We cannot determine at once if the want of intensity, the slowness or the fog comes from the collodion or the bath.

We would like to have some simple and certain rules of diagnosis, or a diviner's rod, which should at once point to the root of our evils. What a fine thing would be an instrument graduated like a thermometer which would show at sight precisely how much above or below zero our operations are!

There are, however, within our reach, some rather simple and practicable tests for the bath and collodion. These I will point out. I would suggest that there be kept on hand a standard bath and collodion to be reserved and used only for tests. These should be made with the greatest care, and so securely kept that they shall not change. If a collodion is suspected, let it be tested in the standard bath, or if a bath be suspected let the standard collodion be tried in it. When two collodions are to be compared, the most ready way is to coat the same glass with the two collodions, giving each one its separate half of the plate. On making a picture, the minutest shades of difference in quickness, intensity, or brilliancy, are plainly shown to the eye.

I propose the test collodion and bath only for the more expert. Their proper use would require rather nicer discrimination and skill than the tyro would be likely to command.

We ought all to be restless for improvement. If other people know more than we do, or can do better than we, let us find it out. Until the photographic art is perfected let us strive for improvement. No photographer has exhausted his capacity,—the pictures which are to bear off the prizes next year are not yet made; the best marksman always aim at the bull's-eye, although he miss it half the time.—*American Journal of Photography.*

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 18th September, 1861.

One of the most interesting features of the present Industrial Exhibition at Marseilles is a series of 200 photographs of engravings from the works of Rubens. These have been collected into five volumes, bound with descriptive text, and published by M. Muquardt of Brussels, at 200 francs the volume. The first volume consists of subjects taken from the Bible, the second contains "Assumptions," "Ascensions" of the Saints, &c. Unfortunately, the progress of this important work has been stopped by the illness of the publisher, who has become insane. These photographs are among the best specimens I have seen of copied engravings, and indeed might under some circumstances be taken for them. "The Brazen Serpent" and an "Elevation of the Cross," are remarkably fine. As the original engravings are very scarce and dear, this publication may be regarded as a boon to art amateurs.

Some photographs from the original pictures of Rubens representing landscapes with men and various animals are not so successful. In this case the difficulties to be overcome were greater, the painter has made use of colours which are not translated in black and white in the camera as in the engraving. However, with all their shortcomings and defects, they possess a certain kind of interest which will reward the photographers for their trouble.

The production of new colouring materials is certainly one of the most remarkable events in the chemical science of the present day; and in this particular coal tar has played the most prominent and important part. M. Ruhlmann has just made public his discovery of a new blue colour obtained from cotton-seed oil. This colour is chemically pure; burned on a slip of platinum it leaves no ashes; every effort to obtain it in a crystalline state has failed. At a temperature of 68° Fah. it is soluble in alcohol of 90° only in the proportion of 1·30 per 100, and in 12 per 100 in pure ether; by the aid of heat it is dissolved more freely, to be deposited in a granulated state upon cooling.

In cold alkaline solutions it is insoluble, but by a long ebullition a small quantity is dissolved, which slightly colours the liquid green.

The new colour is slightly soluble in chloroform, and in sulphide of carbon. In contact with concentrated sulphuric acid, it is dissolved and assumes a purple colour. Upon adding water to this solution the blue colour reappears, and is completely precipitated. Boiling phosphoric, hydrochloric, and acetic acids have no effect upon it.

The reducing agents generally, such as nascent hydrogen, sulphurous acid, the protoxides of iron and of tin, and arsenious acid, do not affect the splendour of the new colour, while the oxydizing agents, such as nitric acid, chromic acid, perchloride of iron, chlorine, bromine, iodine, destroy it immediately upon contact.

The new colour is obtained by keeping the cotton-oil at a temperature of 212° F., for five or six hours, with 3 to 4 per 100 of concentrated sulphuric acid. This contact of oil and acid must be prolonged until the green colour of the oil is changed into a deep blue colour. The blue substance thus obtained contains 48 per 100 of fatty acid; it retains a little free sulphuric acid and some sulphate of soda or sulphate of lime. Repeated washings with warm water separate these latter products, and this separation is still more complete when after washing in water the blue substance is dissolved in alcohol, and afterwards precipitated by water, which retains only a trace of it, but which separates the acid and the sulphates which escaped the washing. In order to separate the fatty body the blue substance must be washed many times successively in naptha, which also dissolves a little of the blue colour so long as any of the fatty body remains in the mixture, but which dissolves only a trace of it when these washings have been several times repeated. Analysis shows its composition to be $C_{34}\ H_{24}\ O_8 =$

$$\begin{array}{l} C\ 69{\cdot}87 \\ H\ \ 8{\cdot}22 \\ O\ 21{\cdot}91 \\ \hline 100{\cdot}00 \end{array}$$

It is difficult to avoid regarding this substance as a new definite organic compound, which combines with nitric acid, chlorine, iodine, and bromine.

The best mode of practically applying this new pigment remain to be discovered; but when we consider that it resists the action of the most powerful acids, viz., concentrated phosphoric and sulphuric acids, like indigo, and of other agents which destroy the colour of indigo, such as boiling perchloride of tin, and muriatic acid, it may be expected that indigo and prussian blue have encountered a formidable rival in this new blue.

Apparatus.

CAMERA FOR FOUR PORTRAITS.

Sir,—I send you particulars of my invention for taking four or more photographs on one plate with one lens. The grand difference between this method and that of other persons who have attempted the same thing, is that while they try to effect their object by some arrangement of the dark slide, or by a modification of the back part of the camera, my plan attains the desired end by means of a circular disc carrying the lens, and working inside the front of the camera; for instance, the camera is divided into four parts by partitions running lengthwise. The lens, in a circular front, which revolves on a pivot in its centre, is placed opposite the lowest or first division. The portrait is taken, the lens is then moved up to the division No. 2, or the one immediately over the first. The next picture is impressed, and so on for the remaining half of the excited plate. There is only one focussing and that is at the commencement. The proper place for the lens to occupy in its course is marked on the front, so that the four pictures are photographed rapidly with merely taking picture the first, putting on the lap, shifting the lens to the next place, exposing and repeating these simple operations through the series until the last one is taken. I shall be happy to furnish any further information about the method should it prove desirable.—I remain sir, yours respectfully, JAMES J. MAGINN.

Manchester, September 11, 1861.

[If we are not mistaken, Mr. Francis constructs a repeating camera on a somewhat similar principle.—ED.]

Photographic Notes and Queries.

ERECTING FOCUSSING GLASS.

DEAR SIR,—If you or any of your numerous readers would, in your answers to correspondents, inform me what number of lenses, with their respective form and foci is required, and what their respective distances apart, in the construction of an erecting focussing glass, you would confer a very great favour on, yours truly, &c., ENQUIRER.

Wigton, September 10.

[We cannot recommend you to attempt the manufacture of an erecting focussing glass, as it must necessarily be a cumbersome and clumsy instrument, and of little service when made; a very little practice renders the eye familiar with the image in its inverted position on the ground glass. As you do not state what magnifying power you require, we can only give you the formula for an ordinary erecting eye-piece, by modifying which you may obtain one of the power you wish. In one of the best forms of the ordinary erecting eye-piece which we know, there are four plano-convex glasses, the first and second of which—that is those next the eye—should have their plano sides towards the eye: the third and fourth their convex sides towards the eye. The radii of the glasses, as follows: the first ·65; the second 1·1; the third ·95; the fourth ·9. The separation between the glasses as follows: between the first and second 2; between the second and third 2·5; between the third and fourth 2·5. Between the first and second a stop must be placed in the focus of the first, of such diameter as will give the required field; and between the third and fourth a stop of about ·25 placed in the focus of the fourth. These radii and distances taken in inches or parts of an inch, will give an erecting eye-piece the equivalent focus of which would be ·7, enlarging about 12 times. As for focussing purposes a power of 4 times is the highest that should be used, you will readily see on multiplying the above figures by three what a cumbersome instrument must result.—ED.]

Talk in the Studio.

NOVEL APPLICATION OF PHOTOGRAPHY.—We were somewhat amused in Manchester to observe on the placards in the lobby of the Exchange, that the index, or hand, pointing the way to the Photographic Exhibition, was the photographic image of a hand taken from life. One of Manchester's most able amateurs and scientific men, we were informed, had "lent a hand" for the occasion.

THE INTERNATIONAL EXHIBITION.—Her Majesty's Commissioners are sending out forms to all known photographers, which they are invited to fill up, stating the space, &c., they will require for exhibiting photographs at the forthcoming Exhibition. All applications must be made before the 30th instant, which is the last day for receiving applications.

PHOTOGRAPHY AND THE WAR.—The *American Journal of Photography* says:—Photography seems not to suffer quite so much from the war as most other avocations. Photographers in the neighbourhood of military recruiting are even doing better than usual. The photograph has become almost an article of necessity. As long as there is a giving in marriage, or the population is increased, the photographer must be in demand. Photography is a habit with some people; it is the mirror in which the belle discovers how she looked on yesterday.

THE CAUSE OF THE PANIC AT BULL'S RUN.—One of our American contemporaries, *Humphrey's Journal*, states that the panic in the Federal army, was caused by the sight of a photographer's camera! "Brady has shown more pluck than many of the officers and soldiers who were in the fight. He went—not exactly like the 'Sixty-ninth,' stripped to the pants—but with his sleeves tucked up and his big camera directed upon every point of interest on the field. Some pretend, indeed, that it was this mysterious and formidable looking instrument that produced the panic! The runaways, it is said, mistook it for the great steam gun discharging 500 balls a minute, and incontinently took to their heels when they got within its focus! However this may be, it is certain that they did not get away from Brady as easily as they did from the enemy. He has fixed the cowards beyond the possibility of a doubt. Foremost amongst them the observer will perhaps notice the well-known correspondent of the London *Times*; the man who was celebrated for writing graphic letters when there was nobody by to contradict him, but who has proved, by his correspondence from this country, that but little confidence can be placed in his accounts. See him as he flies for dear life, with his notes sticking out of his pockets, spurring his wretched-looking steed, his hat gone, and himself the picture of abject despair." Mr. Russell's letters, it would seem, have been too true and "graphic" to be palatable to our transatlantic cousins, and he is, of course, therefore, a falsifier and a poltroon!

To Correspondents.

E. S. H.—If you send us one of your prints we can possibly tell you how to remedy the defect in your lighting. But without seeing the nature of the fault it is difficult to advise. You will find some hints on a substitute for a glass house at p. 296, vol. i, of the PHOTOGRAPHIC NEWS.

A. D. O.—The defect to which you refer, we presume, is the slight amount of tint or discolouration which pervades all the lights of the picture. It would scarcely be considered a defect by some, although it doubtless slightly deteriorates the brilliancy of the print. If white light reaches the paper in any of the operations, that would cause the tint. If you are quite sure you are sufficiently careful in this respect, probably your silver bath is alkaline. A slightly acid reaction is desirable in the printing bath, especially in warm weather, as that will prevent a tendency to spontaneous decomposition of the free nitrate. You may add either acetic acid or nitric. We prefer the latter.

J. C.—There is no reason whatever why the albumenizing and drying of your plates should not be conducted in daylight. The reason why the instructions given for carefully removing dust from the dark-room, and operating there, is, we presume, because that room will be most sacred from intruders, causing draughts, &c. Use any room most convenient to you, only be careful to exclude dust. The wrinkling of the film may be caused by imperfectly cleaned plates, but most probably by the layer or albumen being too thick, and not of a uniform thickness. If the layer be thicker to one end, that end will be most likely to wrinkle. Take care to have the plate perfectly dry before sensitizing.

G. A. E.—We believe the firm to which you refer, Messrs. Hope and Co., is no longer in existence.

L. A. M.—A slight addition of acid to your bath will probably remove the white streaks. A little tincture of iodine added to the collodion will sometimes answer the same purpose. We are not familiar with the working of Jamin's combinations, but so far as we remember, the arrangement for using them as portrait lenses of long focus—in your case for whole plates—consists in removing the back lens entirely, and reversing the tube in the flange so that the front lens becomes the back lens, and the middle lens the front one. The hood of course must be first removed, and then replaced when the lenses are in their new position.

ROBERT DOUGLAS.—We do not remember receiving your letter: will you be so good as to write again, stating its purport.

J. M.—It is undesirable to allow your prints to soak in water very long before toning. Two or three changes of water, and five minutes in each, will remove the free nitrate sufficiently. Slow toning is best; rapid toning is conducive to mealiness.

T. G. L.—The proper place for the stops in a portrait combination ought to be fixed by the optician. The rule is as nearly as possible in relation to the foci of the lenses. Thus: if the focus of the front lens be 6 inches, and that of the back 12 inches, and the distance between the lenses 3 inches, the position of the stop would be 1 inch behind the front lens. You may also ascertain the best place by trying several positions until you find one which has the greatest freedom from distortion.

M. M.—We do not like a wide stereoscopic angle. The exaggerated relief it gives is not truth. We use a binocular camera ourselves. Of course, the prints must be transposed in mounting.

F. G. F.—We use methylated spirits in the developing solution, and find no disadvantage of any kind. It is of course much cheaper.

NIL STANNI.—The purport of your remarks is, perhaps, right; but your letter is not sufficiently courteous in style for publication. We shall probably have something to say on the subject.

EXCELSIOR.—The extent of field covered by a lens does not depend upon its diameter, but upon its length of focus. In a common landscape lens the field covered is generally about two-thirds of the focus. A lens of 20 inches or 21 inches focus may therefore easily enough cover 14 by 12. We can of course form no opinion of this individual lens, but there is no reason why it should not be a good one, and the price is certainly moderate. In order to obtain perfect definition to the edges of the plate you will have to use a small stop. 2. The discolouration of your iron developer is not necessarily a defect. It sometimes works better when it has become somewhat brown. Don't throw it away whilst it does its work.

OUR WEEKLY CONTENTS.—We beg to inform several subscribers that it is not our intention to omit the weekly index. The outside sheet goes to press before the remainder of the number, and the contents were omitted once or twice when we were from home, because it was uncertain, at the time the cover went to press, what articles would be inserted.

MINERAL CARBON, JOHN SYMONDS, THOMAS ANNAN, WILLIAM BIRCHAM, T. S. SWATRIDGE, H. COOPER, D. L. I., and some other correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 160.—*September* 27, 1861.

THE FORTHCOMING INTERNATIONAL EXHIBITION.

There remain three days after the date of the present number, for photographers to make application for space in which to exhibit their works in the International Exhibition of 1862. On the first of October the opportunity for making such application will have passed. Many photographers have already sent in their applications for space; but some, we fear, either from procrastination, or from the misunderstanding between Her Majesty's Commissioners and the Photographic Society, have as yet failed to make any application.

Whatever may be cause of such neglect, whether it arise from intention or thoughtlessness, we earnestly conjure all who can produce pictures which will worthily illustrate the art, to lay aside minor considerations, and at once take the proper steps for securing to their works a place in this exhibition of the whole world's industry and art. There is a season for all things: there are occasions when it is necessary to a man's self-respect that he should stand upon his dignity; but the issues here involved are altogether too important to be sacrificed to any petty considerations of *amour propre.* This is the first occasion on which the photographers of the world at large, have had an opportunity of joining forces, to illustrate the gigantic strides the young art has made towards perfection during its brief existence. In the year 1851 the scope of photography was very limited, and the art, as now practised, was scarcely known. It has now attained an importance then undreamt of, and it would be ten thousand pities to allow any small consideration to mar the completeness of our representation in this great international undertaking.

We have referred to the circumstances which have arisen to damp the enthusiasm of photographers as a misunderstanding; and we use the word advisedly. At the first announcement of the intended classification we were disappointed and outraged at the allocation in which we found photography, and without delay called the attention of the Commissioners to what we regarded as their mistake in classification. Subsequently, however, we find the Commissioners assuring the council of the Photographic Society of their desire to do all honour to photography, intimating their intention of giving a separate apartment for the display of the photography of the world, and asking the Society to appoint a committee to co-operate with them. We have already repeatedly said that we believe the Society would best have served the interests of the art and its votaries by appointing a committee, who might, by judicious management, have obtained all that photographers could hope for. The desire on the part of the Commissioners to have a committee appointed by the Society was the best guarantee of their wish, as far as possible, to meet the demands of photographers. That they should immediately and unhesitatingly alter their arrangements, and suffer terms to be dictated, was more than could be hoped; whilst the offer of a distinct apartment was, with one exception, the very best thing that could be done for the art. The only other concession which we should like to have seen made was the effecting of some change in the nominal classification or cataloguing, so as to remove photography from what was regarded as its derogatory associations. Unfortunately the Society felt concerned to maintain an uncompromising position, demanding all concession from the Commissioners before they could consent to co-operate in any way.

The end of all this is, that the energy which should have been employed in actively preparing during the summer, specimens for exhibiting next year, has been dissipated by this misunderstanding. Uncertain of what was to be the issue, photographers have remained so long in a state of suspense that the interest in the matter has waned, and some from indifference, some from forgetfulness, and some from disgust, have failed to make any application which may enable them to take part in the exhibition. This state of things is, we repeat, much to be regretted; for the sake of the art, and for the sake of England's credit in connection with it, English photographers should do their best to secure a worthy representation.

As our readers are aware, the French society declined to recommend French photographers to abstain from exhibiting. We have reason to believe that the contributions of French and other continental photographers will be large and of high quality. The present exhibition of photographs in France is one of the most important, both in extent and excellence, that has been known; the number of specimens amounting to some thousands, and the majority exhibiting the highest ability. Some thousands of photographs are also now collected in the exhibition at Florence. Surely then if England invites the world to a competitive exhibition of its productions, English photographers will not willingly be distanced or surpassed in such a competition, or at least not without an effort to maintain supremacy.

All minor considerations should be now laid aside. Photographers have made their protest. If their works be pronounced as worthy of the niche in the Temple of the Fine Arts which they claim for it, no mistaken arrangement in classifying will prevent its taking its proper position in the minds of the educated public. Let us admit for the present that the art does occupy a novel position; it is young, and has yet to win its spurs. We have no doubt about its claim to a fine art position; but if others doubt it, let us prove its claims practically rather than verbally. Let us produce works of art that will not admit of cavil. Engraving had to fight for its position, and has but recently received formal recognition of its claims. Photography also will have to prove its claims; but a representation at the present exhibition of overwhelming excellence, will be one of the most important steps that can be taken to that end, and no matter how catalogued, let us be content to await the world's verdict.

There is just time, for those who have neglected hitherto, to make their applications for space, which must be sent in before the termination of this month. Forms of application may be procured from the office of the Commissioners, 454, West Strand. For the assistance of those who may not have time or opportunity for securing these, we subjoin the form in which applications must be made, and once more conjure our readers to exert themselves for the honour of the art.

INTERNATIONAL EXHIBITION, 1862.

DEMAND FOR SPACE.

	(To be written very clearly.)
1. Name and Christian of Applicant (or Name of Firm) - -	
2. Nature of business carried on -	
3. Address { No. of Street or Square, and Name of Town - -	
4. Nature of Articles to be exhibited	
5. Class* in which they are to be exhibited - - - - -	No.

	Floor Space.		Hanging, or Wall Space.	
6. Probable space that will be required for Articles, or for Case in which they will be shown -	Length	feet.	Height	feet.
	Breadth	feet.	Width	feet.
	Height	feet.		

"UNTOUCHED" PHOTOGRAPHS.

What is an untouched photograph? This is a question recently asked of us by a correspondent, referring to some comments we made on a photograph in the Manchester Exhibition. The picture was a very fine one of "Loch Ranza," by Mr. Annan of Glasgow: it was marked "untouched;" but we observed that it had some suspicious looking clouds. Mr. Annan informs us that it was printed from two negatives; but that neither the negatives nor the print was touched. Mr. Annan adds:—

"I have often seen, and believe it is the universal custom to stop out the skies, and tone them down in the print. That is double printing, and yet I never saw them challenged as "touched" pictures, and I thought I had a better right to call mine untouched, than those who paint out their skies in the negatives.

"My method of printing is this; the greater part of my negatives are taken by the wet collodion process, and generally my skies are dense enough to print pure, and the tannin negatives likewise, or when they are not I protect them while printing by some simple appliances, always taking care that the horizon is never interfered with, and then I print in my clouds which are taken from *nature*. And notwithstanding all that has been said against this way of getting clouds, I believe it is the only way at present of getting a natural daylight-look about a photograph."

He further adds, that even the best photographic landscapes, with natural clouds taken at the same time, have an effect more like moonlight, than the broad light of day.

We readily admit part of this allegation. Many photographs which have had a sufficiently short exposure to secure natural clouds, have a sombre, evening, or moonlight effect. But this is by no means universally true. We have seen many, and we have some, photographs with fine clouds and atmosphere, but which are yet suffused with sunlight. These of course are restricted to certain subjects. Where much green foliage is present, we admit it is next to an impossibility to render all its details, and secure at the same time the perfect forms of clouds. This is a subject into which, however, we cannot here enter at large.

We have now to answer the question—What is an untouched photograph? We think it should be taken to mean a print as it is produced from the negative, without "dodging" of any kind whatever. If literal verbal accuracy only be regarded, the word might admit of much quibbling. What is "touching?" In its technical sense the term is applied to the process of improving the print by means of the artist's pencil. But why should the operation be confined to pencil and pigment? The application of the pencil of light, if it produce a similar result, is surely still touching. And if this be admitted, where shall we draw the line? The term "untouched" is unquestionably meant, in its absolute sense, to describe a perfect print from a perfect negative, needing no aid from the hand of the artist. The French meet the case very stringently: in their present exhibition there are many specimens marked as without retouching in either negative or positive. Some will exclaim, surely, a picture is not to be disqualified from a position amongst "untouched photographs" by having a few spots "touched" out. It is a difficult point to decide: if a spot may be stopped out, why not a sky? and if a whole sky, why not part only, so as to produce clouds?

Perhaps we may meet this view of the case by asserting that, except as a kind of photographic *tour de force*, we do not attach an overwhelming value to the idea of being untouched. We delight to see perfect photography. A negative without blemish of any kind whatever, free from spot, stain, or fog, and full of exquisite gradation, affords us a technical pleasure, altogether apart from the prints it will produce. But when we come to the question of results, we would rather see an artistic picture than technically perfect photography. We would prefer to see an awkward figure masked out, a harsh outline subdued and toned down, however perfectly rendered it may have been in the negative. We do not object to the indication of clouds in the negative, if it be done well; nor to the printing from two negatives, if the harmonious conditions necessary to produce natural effects be observed. As we have before remarked, in these matters success is the test of legitimacy.

Some time ago, when Mr. Samuel Fry introduced this method of double printing to the South London Society, it met with much opposition from some good photographers, who regarded it as a step in the wrong direction, destructive of the truth of photography, and as tending to raise the mechanical art of neatly combining several negatives to make one picture, rather than the higher art of securing perfect results without such contrivances. Whilst heartily sympathising with the intention implied in the condemnation of this practice, we must admit there are cases where the results are good and the practice commendable. We cannot decry the application of artistic taste and skill in the process of printing. The more perfect the negative the less of this skill it will require in producing prints; but we think that in printing from defective negatives, the application of the taste and judgment of the artist, in concealing defects or adding beauties, is both legitimate and desirable. It is not the principle, but failure in applying it, which is to be condemned. The legitimacy of some such practice is universally admitted; the only doubt seems to be where to draw the line. Vignetting is the simplest form in which the principle can be applied; then follows masking some parts of the negative, then the tinting of skies, then the painting of clouds on to the negative, and then double printing. All these are based on one principle, the desire to produce a finer print than the negative in its simplicity and entirety will yield The more complex the method, and the more ambitious the results aimed at, the greater the knowledge and skill necessary to secure success. As a general principle the simplest methods, and the most unpretending the results, are those most certain to please, or at least pass unchallenged.

All this brings us once more to the consideration we lose no opportunity of urging upon photographers—the im

* Photography is Class 14, Section II.

portance of education in art. With a mind and eye cultivated to the careful observation of natural and artistic truth, the photographer could never be guilty of gross blunders in this respect. And whether a picture have been produced at once by the most perfect photography, or whether it required the application of all the multiplied appliances which could be brought to bear upon its modification, it will not be tolerated without it possess, in addition to whatever other qualities, something of harmony, keeping, and truth.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Nitric Acid—continued.—The ordinary impurities likely to be present in commercial nitric acid require a little attention. They are *hyponitric acid, chlorine, sulphuric acid, iodine, potash and soda salts, sesquioxide of iron*, and other fixed substances.

Hyponitric acid is a very frequent impurity, but it is one the presence of which is not of much consequence to the photographer. It is difficult to remove, and even if after considerable pains an acid has been obtained free from it, it soon forms again. as, under the influence of light or heat strong nitric acid spontaneously splits up into hyponitric acid and oxygen. It is, therefore, not worth the photographer's while to attempt its removal. Its presence in nitric acid is the reason why this acid when diluted with two or three times its volume of water precipitates sulphur from an aqueous solution of hydrosulphuric acid, and separates iodine from iodide of potassium; neither of which the pure acid would accomplish.

Chlorine is a much more serious impurity, and one which should not on any account be allowed to be present. It is easily detected by diluting the acid with four or five times its bulk of water, and adding nitrate of silver. A white precipitate shows the presence of chlorine. The concentrated acid may be freed from this impurity by heat, the chlorine together with the hyponitric acid and a portion of nitric acid distilling over first. Some writers recommend a process of precipitating the chlorine by nitrate of silver from the dilute acid, decanting from the insoluble chloride of silver and distilling from the excess of nitrate of silver. We do not, however, recommend this, as it is very troublesome, and not a bit more effectual than the former method of heat. The process of distillation over metallic silver, recommended by Bescherer, is not accurate, as some of the chlorine may still pass over with the nitric acid. The acid cannot be purified from chlorine by means of oxide of lead, because the chloride of lead dissolves in the nitric acid, and is again decomposed on the application of heat.

Sulphuric acid may be either an accidental impurity or an intentional adulteration. In the latter case it is added for the purpose of raising the specific gravity of a weak to that of a strong acid, and consequently making it appear of more value than it otherwise would be. As an accidental impurity it may be present from the neck of the retort becoming soiled when the acid is poured down it; from the spirting of the mixture; or from using too large a quantity of oil of vitriol, and heating too strongly. It may be readily detected by diluting with four or five times its volume of water, and adding nitrate of baryta. A white precipitate indicates the presence of sulphuric acid. This impurity is readily removed by redistilling from a small quantity of nitre, or by precipitating the previously-diluted acid with pure nitrate of baryta, allowing the precipitate to settle, decanting and distilling the clear liquid.

Iodine is not an uncommon impurity in nitric acid, owing to Chili saltpetre (nitrate of soda) containing this body. It may be detected by neutralizing with potash, adding a little starch paste, and then adding oil of vitriol slowly, drop by drop. The smallest trace of iodine causes the liquid to assume a blue colour. The iodine may be removed by careful distillation. The nitric acid comes over first, and leaves the iodine till towards the end of the operation.

Potash and *soda salts, sexqui-oxide of iron*, and other *fixed substances*, are detected by evaporating a little of the acid to dryness at a gentle heat. A solid residue will show the presence of some such impurity. It can be removed by distillation.

Sulphuric Acid.—This is one of the most important chemical agents known, both on account of its intrinsic valuable properties, and owing to the numerous other substances, for the manufacture of which it is necessary. Thus without sulphuric acid the photographer would have no ether, guncotton, nitric acid, iodide of potassium, hyposulphite of soda, nitrate of silver, sulphate of iron, and many other less important chemicals, or at all events the difficulties in their manufacture would be so greatly increased as to amount to almost a prohibition of their use; whilst the commercial value of this acid is such that its manufacture is one of national importance, the fluctuations in its price affecting chemical and other works in nearly every town in the kingdom.

The ordinary form in which sulphuric acid is met with is in that of *oil of vitriol*, which is a very heavy, oily-looking, highly corrosive liquid, consisting of one part of the anhydrous acid, with one part of water. It is only prepared on the large scale by burning sulphur mixed with one-eighth of its weight of nitre in a spacious chamber made of lead, filled with air and aqueous vapour, and having its floor covered with water. The nitrous acid obtained from the nitre, acts as a carrier of oxygen, taking it from the air, and giving it up again to the sulphurous, which is thereby converted into sulphuric acid; the reproduced nitrous acid being ready to carry a fresh portion of oxygen to another portion of sulphurous acid. The sulphuric acid which is thus formed dissolves in the water, which is at the close of the operation drawn off and concentrated by evaporation, till it becomes of a density of 1·78, when it is further purified by distillation. Formerly platinum retorts were used for this purpose, and as these were required to be very large and of a sufficient thickness to stand wear and tear of use, their expense was an important item in a sulphuric acid works, a large still costing some thousands of pounds. Lately, however, glass retorts are coming into use again, the manufacture of these having been greatly improved, so that they are now supplied of a larger size and superior quality. The above is a brief outline of the process of manufacturing English oil of vitriol. On the Continent it is made in a different way. Green vitriol, which has been freed from its water of crystallization, and converted into sulphate of the peroxide of iron by heating it in the air, is placed in earthen retorts heated in a reverberatory furnace. The acid is received in earthen receivers, into which a little water, or what is preferable, common oil of vitriol, is placed. In this way a light brown, viscid, oily liquid is obtained of 1·896 specific gravity, fuming in the air, and evolving thick white vapours of anhydrous sulphuric acid when heated. This quality is called *fuming*, or *Nordhausen* oil of vitriol.

The English oil of vitriol, which is the only quality which the photographer is likely ever to require, is a colourless, transparent, oily liquid, which is inodorous, and non-volatile at ordinary temperatures. Its specific gravity is 1·848, it boils at about 300°, and passes off unaltered, forming a thick white cloud when in contact with the air. It corrodes organic matter strongly, being coloured brown by them, a drop of it falling on wood or the clothes, charring and destroying them like a red hot iron, in a few minutes. It has a most powerful affinity for water, one part of oil of vitriol placed in an atmosphere saturated with aqueous vapour, absorbing 15 times its weight of water. Its combination with water is attended with great heat; 4 parts of oil of vitriol being mixed with 1 part of water raising the temperature from the freezing to the boiling point of water. Strange to say, however, if oil of vitriol be mixed with a little more than its own weight of snow, intense cold is produced. When the diluted acid is boiled, water goes off and oil of vitriol is left, which upon increase of temperature distils unchanged.

The characteristic test for sulphuric acid, either alone or in combination with bases, is its forming a compound with baryta, which is perfectly insoluble in water and dilute acids. If a very dilute solution of sulphuric acid be mixed with chloride of barium, a white precipitate is formed which is insoluble in nitric or hydrochloric acid. No other re-agent acts in a similar way. The delicacy of this test is such that a solution containing 1 part of sulphuric acid in 100,000 of water, produces a turbidity when mixed with a baryta salt, and even in 200,000 parts of water a cloudiness is produced after the lapse of 15 or 20 minutes.

PRINTING AND TONING.

BY J. C. LEAKE, JUN.

The importance of this branch of the photographers' art cannot be over estimated. It is the process for which all the other processes are made. The public care not how we produce our negatives, but they do care a great deal about our printing. Reasonably they ask are they permanent, and reasonably they point the defects so painfully apparent in so many photographic prints. Thus it becomes of vital importance to produce permanent and beautiful prints, as on this the future success, perhaps, I might say the very existence of photography depends. These considerations have led me to lay before your readers a few remarks on some of the conditions required in order to produce the best results.

To begin at the beginning, it has been often said that to produce a brilliant print by the alkaline toning process a much more intense negative is required than is necessary for the old sulphur toning. This is a mistake; any negative that will print a *good* proof by the old method, will, at least, do as much by the new; and experience leads me to the belief that most negatives are too intense; much of the delicacy and beauty being destroyed by the long-continued action of pyrogallic acid and silver, which completely obliterates the more delicate details and destroys the gradation.

It is not intensity, as it is generally understood, that will give brilliance, but a complete system of gradation, a perfect series of tones starting from bare glass in the deepest shadows. And to this must be added a good printing process; and some skill and judgment in the treatment of each particular negative as its peculiarities may require.

We are practically restricted to the use of two kinds of paper, *Rive* and *Saxe*, the English papers are too coarse and absorbent. Of these the *Rive* is the best, on account of its superior hardness and fineness of surface. The *Saxe* is, perhaps, more free from blemish, and the black tones are more easily produced on it; it is also free from the plague of blisters. For small pictures the *Rive* is best, while for large ones *Saxe* may possess some advantages. Of albumenizing nothing need be said, as most persons procure their paper ready for use. I must, however, remark that many of the defects attributed to bad albumenizing are really owing to defective paper.

The next process, that of sensitizing, is, perhaps, the most important of all. A little neglect here and all the care bestowed upon the former and subsequent operations will be lost. It is a vital point to keep up the strength of the silver solution. Unless this be done, no depth of tone can be obtained, the prints will lack brilliance, and will be grey and mealy. The strength usually recommended, sixty grains to the ounce is often not enough for the amount of salt in the albumen; seventy is a safe quantity for all ordinary purposes, and to this standard it should at least be kept up.

So long as the paper keeps white for twelve hours no addition of acid need be made to the solution; but a tendency to yellowness in or to the removal of the albumen from the paper will be best removed by a few drops of acetic acid. A sample of paper, which removed all the colour from the sensitizing bath, was recently brought under my notice. To prevent any difficulty from this cause now, I am informed not unfrequent, the bath should be kept perfectly colourless by means of kaolin.

Three minutes will be found quite long enough to allow the paper to remain on the bath. It is better not to let the solution soak into the paper, or a loss of brilliancy will result.

The little instrument used in the kitchen to time the boiling of eggs, will be found useful for timing this part of the process. The paper is better if dried before a fire; and it should be used at all events before twenty-four hours, and the sooner the better.

After removal from the pressure frames the prints should be well washed to remove the free nitrate from the surface; it is as well to perform this operation quickly, or the paper will become saturated with the nitrate solution which will interfere with the toning process.

The toning baths most usually recommended are three, as follows:—

No. 1.—Carbonate of soda	...	5 grains
Chloride of gold ...	...	1 grain
Water	...	10 ounces.

My impression is that this is the worst of the series here to be mentioned. It has to be used warm, it is not so economical as either of the others we shall name, and as it will not keep and cannot be used a second time it is very inconvenient; it, moreover, reduces the print considerably, rendering necessary considerable over-printing.

The next bath, known as Maxwell Lytes, we will call—

No. 2.—Phosphate of soda	...	18 grains
Chloride of gold ...	...	1 grain
Water	...	4 ounces.

This is decidedly the better bath of the two, as it will keep a day or two after mixing, and it does not reduce the print nearly so much as that first mentioned. The proofs are a nice purple tone with velvety shadows.

The acetate of soda bath, known as the Abbe Laborde's.* is, however, superior to both of these. The formula I use stands thus:—

No. 3.—Acetate of soda ...	...	½ ounce
Chloride of gold ...	...	4 grains
Water	...	1 pint.

This bath must be mixed twenty-four hours before use. It has, in my hands, proved very successful, the prints are of a rich warm tone; and it is difficult to obtain anything like coldness or mealiness if ordinary care be taken. It may be used over and over again till all the gold be abstracted. The best method of proceeding is as follows:—Mix, say a pint, and use it till it begins to work slowly; then mix a second pint, and from time to time add as much fresh solution as may be required to make it work comfortably. This bath must always be used cold; it tones in about ten minutes, and the over-printing need be very slight, as the depth is but little altered.

This is my favourite method of toning, and it approaches nearly my ideal of a toning process in the following particulars:—First, the solution may be kept without deterioration; second, it may be used cold; and, thirdly, it does not reduce the print; all three being good points, the last named in particular.

There are two more toning baths which have been used by me with some success, these are that with chloride of lime (Legray's), and one with carbonate of ammonia. The formula for the first is as follows:—

Chloride of lime	... ...	5 grains
Chloride of gold	... ...	5 grains
Water	... ...	1 pint.

In this bath the prints are bleached a good deal, but not more than in the carbonate of soda bath before-mentioned, and the tones of the finished pictures are rather colder than

* The credit of the first suggestion as to the use of acetate of soda in conjunction with gold in toning, is due to Mr. Hannaford.—Ed.

where the acetate or phosphate of soda is used. For the carbonate of ammonia bath mix—

Carbonate of ammonia	...	10 grains
Chloride of gold ...	...	5 grains
Water	...	1 pint.

Both of these solutions to be used cold; the latter will keep two or three days, and both must be mixed a few hours before use.

The process with carbonate of ammonia seems a promising one, and the prints have somewhat the effect of those toned in the old toning bath of hypo and gold.

After toning in any of these solutions, the proofs should be *well washed* before fixing. This operation should be quickly and carefully performed. A solution of hyposulphite of soda, six ounces to a pint of water being poured into a deep dish, the prints should be carefully immersed, one at a time, kept constantly moving, and be well watched. As soon as the fixation is completed, which may be ascertained by looking through the picture, it should be at once removed and well washed, back and front, each print separately, before being placed in the dish or trough in which the prints are left to wash and soak in common.

BEATTY'S PATENT HELIOGRAPHIC PRINTING.

For the Production of Photographic Representations in Printers' Ink.—[*Communicated.*]

The object of this invention is to extend the application of photography, by substituting for the salts of silver (used in the ordinary printing of a photograph), an imperishable and cheap material, "printers' ink," and printing the impression at the printing press now in use; thereby rapidity of production, and consequently, cheapness will be the result.

By photography the most elaborate and minute design can be copied of any desired dimensions, and by the heliographic printing the impressions of those designs can be multiplied, and at the same time preserve the delicate pencil of the sunbeam as the graphic agent.

If then the photograph can be thus printed in printers' ink with the same facility as a drawing on lithographic stone, made in the ordinary manner, or on a metal block, for the purpose of printing by the ordinary letter-press, without the preliminary cost of engraving or drawing, there can be no reason why the most beautiful designs and drawings should not be sold at a price but little above the cost of the paper on which they are printed.

Therefore, the advantages to be derived by the introduction of this patented process may be considered with reference to the following:—

First.—It enables the photographer to give a perfectly faithful reproduction of the scene or object he may desire, without omitting the most minute detail, and if he wish, print on it a graduation of tints and colours with a certainty that these productions are not liable to fade.

Secondly.—The perfect reproduction of manuscript drawings by means of photography, and the transferring of them perfect on to lithographic stone for surface printing, or on metal blocks to print in combination with type, opens a new field to the artist, the architect, the surveyor, and the mechanical draughtsman, instead of having to rely upon the abilities of the lithographic artist, or wood engraver, to reproduce their design, and render to it the faithful character of the original, the patent heliographic printing process supersedes their labours, and offers peculiar and unique resources. Copies of architectural drawings, old or new maps, plans, and drawings of complex machinery, which would require much time and talent on the part of the draughtsman, would be available as soon as wanted, and the copy may also be enlarged or diminished from the scale of the original. As soon as the various professions are satisfied of the resources offered by this new art, it will become an indispensable appendage to every well-regulated publishing and lithographic establishment, as well as government offices.

Thirdly.—For the reproduction of valuable old and rare paintings and engravings of the olden masters. By heliographic printing processes we can produce a faithful transcript of the original, preserve the style and execution, by this means improve the taste, and form a correct judgment of their works; whilst the choicest of our modern works of art, the publishing price of which is beyond the reach of the general public, can be reproduced and published of any desired dimensions, placing the richest of our pictorial illustrations within the reach of all.

Fourthly.—Heliographic printing and copying by means of photography does not require the originals to be in printers' ink (recently printed), they copy alike from written documents or old printed matter and faithfully reproduce any number of impressions in fac-simile and in printers' ink. This art will be invaluable to the antiquary, to the librarian, to the curators of museums, to the legal profession, and to the Government for the preservation in fac-simile of valuable documents which now exist, and which are of so much value that the loss by risk or accident, such as fire, &c., &c., would be productive of great inconvenience and injury. Members of the legal profession are afforded a quick and economical means of having reproduced in fac-simile important documents, wills, &c., superior to any other mode of obtaining duplicates at present in use, and curators of museums will find in this art an endlesss resource for the reproduction of fac-similes of valuable literary curiosities for the benefit of the curious in such matters.

Fifthly.—The proprietors of extensive publishing, printing, and lithographic establishments will, by the introduction of the principle of the heliographic printing processes, be enabled to extend the resources of their business. As an example, the publisher of a work, by merely furnishing a copy of the book required to be republished, its pages can be copied by this process and made into surface printing blocks, including the engraved illustrations, if any, in a durable material—zinc, and can be of enlarged or reduced dimensions, to answer as a 12mo, 8vo, or 4to, saving the price of re-setting, reading, and the engraving of the illustrations. The advantages to the lithographer are so varied and important that it is needless to dwell upon them; suffice it to say that they are intimately interested in all that is stated, and also will be enabled to enrich their productions by copying by the process from the works of the best landscape, portrait, ornamental, and map, engravers, and are in possession of the means for the reproduction of photographs of external objects to illustrate books of all descriptions, as well as those gems of science and art, stereoscope pictures, printed in colours of a more permanent character than is now obtainable, and will be able to produce them at one-tenth the present cost.

Sixthly.—Map and chart publishers will, as a necessary consequence, avail themselves of a means whereby they can have at a cheap rate many sized maps from one original. And the Ordnance Survey of the kingdom will furnish materials for the production of detached maps of cities, and provincial towns, counties, parishes, townlands, estates, and forms for the purposes of the Landed Estates Court, and for the registry of deeds, or for sale at a moderate rate to the public.

And lastly.—Many advantages will be derived by the traveller, the philosopher, and the man of taste by this new art enabling them to reproduce their works for publication at a moderate cost. The botanist and the naturalist will be enabled to retain fac-similes of all objects whether flowers, leaves, trees, insects, or animals of any description that interests them most, These in general will not only contain a correct representation, but sufficient detail to afford a view of their distinctive character. In fact, every one who loves to study nature, either in her outward form by art, or to observe and trace her in the more obscure walks of science, must feel interested in so valuable a discovery, where, strictly speaking, art and science go hand in hand.

British Association for the Advancement of Science.

ABSTRACT OF THE REPORT OF THE KEW COMMITTEE.

The report of the Kew Committee opens with a statement of the extension of the system of photo-magnetic recording, and a reference to the various sets of instruments for carrying out these records verified during the year for different parts of the world. It then proceeds to the subject of photo-heliography, regarding which we make the following extracts, which will be interesting to our readers.

"At the last meeting at Oxford it was announced that the Kew heliograph was about to be transported to Spain for the purpose of photographing, if possible, the so-called red flames visible on the occasion of a total solar eclipse.

"It will be remembered that, at the suggestion of the Astronomer Royal, the Admiralty had placed at the disposal of the expedition of astronomers H. M. S. 'Himalaya,' and that the Government Grant Committee of the Royal Society had voted the sum of £150 for the purpose of defraying the expenses of transporting the Kew heliograph, with a staff of assistants, to Spain.

"Originally it was thought that a mere temporary tent, for developing the photographs, might have answered the purpose; but on maturing the scheme of operations, it became evident that a complete photographic observatory, with its dark developing room, cistern of water, sink, and shelves to hold the photographs, would be absolutely necessary to ensure success. The house, when completed, weighed 1,248lb., and was made up in eight cases. Altogether the packages, including house and apparatus, amounted in number to thirty, and weighed 34 cwt.

"Besides the heliograph, the apparatus comprised a small transit theodolite for determining the position of the meridian, and ascertaining local time, and the latitude and longitude of the station; and also a very fine three-inch achromatic telescope, by Dallmeyer, for the optical observation of the phenomena of the eclipse. Complete sets of chemicals were packed in duplicate in separate boxes, to guard against failure through a possible accident to one set of the chemicals. Collodion of different qualities was made sensitive in London, and some was taken not rendered sensitive, so as to secure as far as possible good results. Distilled water, weighing 139lb., had to be included; and engineers' and carpenters' tools, weighing 113lb., were taken.

"The total expenditure of this expedition amounted to £515, the balance of £362 over the amount granted by the Royal Society has been generously defrayed by Mr. De la Rue.

"Upwards of forty photographs were taken during the eclipse, and a little before and after it, two being taken during the totality, on which are depicted the luminous prominences with a precision impossible of attainment by hand drawings. The measurements which have been made of these prominences by Mr. De la Rue show incontrovertibly that they must belong to the sun, and that they are not produced by the deflection of the sun's light through the valleys of the moon. The same prominences, except those covered over during the moon's progress, correspond exactly when one negative is laid over the other; and by copying these by means of a camera, when so placed, a representation is obtained of the whole of the prominences visible during the eclipse in their true relative position. The photographs of the several phases of the eclipse have served to trace out the path of the moon's centre in reference to the sun's centre during the progress of the phenomenon. Now, Rivabellosa being north of the central line of the moon's shadow, the moon's centre did not pass exactly across the sun's centre; but was depressed a little below it, so that a little more of the prominences situated on the north (the upper) limb of the sun became visible than would have been the case exactly under the central line, while, on the other hand, a little of those on the southern limb was shut off. It has been proved by measuring the photographs, that the moon during the totality covered and uncovered the prominences to the extent of about 94″ of arc in the direction of her path, and that a prominence situated at a right angle to the path shifted its angular position with respect to the moon's centre by lagging behind 5° 55′. On both the photographs is recorded a prominence, not visible optically, showing that photography can render visible phenomena which without its aid would escape observation. Copies of the two totality pictures are being made to illustrate Mr. De la Rue's paper in the report of the 'Himalaya' expedition by the Astronomer Royal.

"Positive enlarged copies of the phases of the eclipse, nine inches in diameter, have also been made by means of the camera, and will be exhibited at the Manchester meeting.

"The work of the Kew Observatory is now so increased that it has become absolutely imperative to make some provision for working the heliograph in a way that will not interfere with the current work of that establishment; and Mr. De la Rue has been requested by his colleagues of the Kew Committee to take charge of the instrument at his observatory, where celestial photography is continuously carried on. This request Mr. De la Rue has kindly acceded to; and he will for a time undertake to record the sun spots at Cranford, as long as it is found not to interfere with his other observations. Mr. De la Rue has contrived, and had made by Messrs. Simms at his own expense, an instrument for measuring the photographs, which will much facilitate the reduction of the results. It consists of a fixed frame in which work two slides, moving at right angles to each other. Each is furnished with a vernier reading to 1-1000th of an inch. The top slide works on the lower slide, and carries a hollow axis 4½ inches diameter, on which rotates horizontally a divided circle reading to 10″, and this carries a second circle on the face of which are fixed four centring screws. An image intended to be measured is placed on the upper circle, and is centred by means of the adjusting screws; it is then adjusted by means of the upper circle in any required angular position with respect to the lower divided circle, so as to bring the cross lines of the photograph in position under a fixed microscope, supported on an arm from the fixed frame. By means of this instrument the sun pictures are measured so as to determine the diameter to 1-2000th of the radius; the angular position of any part of a sun spot and its distance from the centre are thus readily ascertained; or the differences of the right ascension and declination with respect to the centre are as easily read off to the same degree of accuracy.

"Mr. De la Rue has recently produced by his large telescope an image of a solar spot, and a portion of the sun's disc, far superior to anything before effected, and which leads to the hope that a new era is opened in heliography, and that the resources of this observatory might be further developed in that direction.

"At the last meeting of the Association the sum of £90 was voted for an additional photographer, and of this sum £50 has been received. The committee suggest that the balance of £40 be granted again at this meeting, as the full sum will be required during the ensuing year. A detailed account of this expenditure will be presented in the next annual report.

"Allusion was made in last report to an instrument constructed by Prof. William Thomson, of Glasgow, for determining photographically the electric state of the atmosphere. This instrument has been fitted up at Kew, where it has been in constant operation since the beginning of February last. It has been found to answer well in a photographic point of view, and Prof. Thomson has expressed himself much pleased with the results obtained."

WET COLLODION WITHOUT WATER.

BY COLEMAN SELLERS.

In a recent number of this Journal it is asked if I still use my glycerine process in the field—and if the flowing of the developed plate with glycerine before washing stops the development, &c. Having just returned from a short trip among the mountains, and having, as Oliver Wendell Holmes says, brought home with me cuticles stripped from the rocks and pine-trees, distant mountains, and beautiful clouds,—I feel better prepared to answer questions, and hoping that my experience may be of use to others I will in a few words show how I use the process.

Water is a good thing to have in the house, and a good thing to have in the field, but may be dispensed with photographically for a time thus:—Have in the dark tent, in addition to the usual chemicals, a bottle of glycerine diluted with one-third its bulk of water, also a bottle of silver solution twenty grains to the ounce, with one-quarter ounce of acetic acid to each ounce of solution. The addition of this acetic acid enables silver to be added to the developer already on the plate without staining. Having developed as usual, as far as the first application of iron will take it, examine its intensity and if it requires more silver add it from the solution above described, flowing it well over the plate, but not draining back into the bottle, then pour on more developer. This can be repeated without washing until the required intensity is produced. When, having well-drained the plate, flow it with glycerine, pouring it on slowly at one corner, and seeing that in its course over the film it carries with it all spangles of silver left by the developer. This is the important point and the only trouble I have experienced is some of the metal silver becoming attached to the film so that no after washing would remove it. It is best to drain off this first coating and add a fresh lot of glycerine. Then place the plate, film side up, in a plate box so arranged as to hold the plates in a horizontal position.

If the dark tent used is of such a nature that the plate box may be kept within it, there is no need of pushing the development in the manner above described, but flowing with glycerine as soon as the first application of iron has done its work, and then inclosing in the plate box,—keeping it away from the light until it can be washed and the development proceeded with. I have made many pictures without any water in the field, but when I can I prefer to use water freely—that is where water can be got without any trouble. It is also economical in other cases to have a few ounces of water, not enough to wash the plates, but merely enough to flow over and drive off the spangles of metal silver before applying the glycerine, as water is the cheapest article of the two. I find that 16 ounces of water is more than enough for a long day's work on stereoscopic pictures. The glycerine does not check the action of the developer, but where iron is used there is no need to check its operation, as it is limited in its power as a developer; the glycerine keeps the film moist for a greater time than any syrup.

The only precaution to be taken is, that if a picture thus treated has been exposed to the light before completion, no silver must be used in the strengthening process, but having washed and cleaned the picture resort to bichloride of mercury to obtain the requisite degree of intensity.

Hoping my readers will not deem me inconsistent as the author of the glycerine process before washing, I would urge them to use it with prudence, observing the precaution above mentioned to insure good work,—and by all means if it can be got, and, if any kind friend can be called upon to help carry the fixings, to take with them a bottle of water,—it may be wanted to drink you know, a little will do the pictures no harm.—*American Journal of Photography.*

A CONTEMPORARY HOBBY.

BY THE AUTHOR OF "LORENZO BENONI."*

I don't know how it fares with you in London, but I know that we in Paris have a sorry life of it. By which *it* I do not allude to the frost, nor to the macadamized Boulevards, nor to the tightness of the money-market—no, nor yet to the indefinite rise of house-rents, but to a far worse nuisance—the cardomania. Ever since it has become the fashion to have squinting, ghastly photographs, instead of the true, plain, honest visiting-card—ever since it has become the fashion to make collections of these said photographs—above all, ever since the fatal invention of albums *ad hoc*, farewell peace! Whichever way you turn, requests for your portrait are levelled at you like so many guns. All is acceptable prey; indifferent features, respectable age, obscure position—nothing comes amiss to that greedy monster, Album.

I give myself as an example. I, socially speaking, one of the most insignificant beings in creation, had so many home thrusts to parry of late, that at last I was thrown out of the saddle. A lady did that for me—a clever and accomplished blonde—beware of blondes. She was doing me the honours of her album, and I was on the defensive. We came to an empty niche. She said pleasantly, calmly, decidedly, "That is for you." I did all a man can do—very little, I allow, when the adversary is one like my softly determined, smilingly implacable hostess—I laughed outright, found the joke excellent; then I became serious. She knew my habits—my dislike of all that makes a man a plaything, and so on. Grave or gay, it mattered not. Let the fair sex alone for holding to the point when it suits them.

"If, by New Year's Day," said the lady, "this niche is not filled by your photograph, I shall have been mistaken in your gallantry." I protested in favour of my gallantry; but surely she would grant me a respite, considering that just at that moment I was very busy—in all truth, overworked . . .

"Oh, sir," was the quick rejoinder, "if I were asking for a miniature, even for a sketch in crayons; but a photograph! a sacrafice of five minutes!"

Whatever my misgivings about the five minutes, we live, as everybody knows, in a chivalrous age, and, to use the words of a great man, I am a man of my times. So I bowed my head, whispered something about wishes being commands, and went my way. My last thought on going to sleep that night, my first thought on awakening next morning, was that I must go and have my photograph done.

When a tooth must come out, the sooner it is out the better. In compliance with this wise aphorism, I sallied forth in quest of a—I was going to say "dentist"—in quest of a photographer. No need to go far; every second door on the Boulevard boasted the name of one. Next to literature, photography seems to be the favourite vocation of those who have none. Let me see. Mr. Perlet, *chemiste photographe.* Too much by half. I shall have to pay for the chemistry. Mr. Perlet shall not have my custom.

Messrs. Verplick Candish. This sounds outlandish, but safer;—a first-rate establishment—at least, if one may judge by the outside. Behold a richly-carpeted staircase, a banister of gilt and red velvet with coloured crystal globes at intervals, red velvet *portière* concealing the sanctuary to which the gorgeous ascent led!—Who pays for all this finery? Never mind. I shall do my blonde friend's behest handsomely.

So up I went, and, raising the crimson drapery, entered an ante-room, midway of which I was met by a fashionably-dressed gentleman, who asked if I had come for *cartes de visite.* I replied, "Exactly so; for *cartes de visite.*" "Very well. Would I give myself the trouble to walk this way?" and the well-dressed gentleman passed behind a railed desk, while I took up a position in front of it. A voluminous ledger lay open on the desk.

"Will Monsieur give his name?"

As I had come for a portrait, and not for a passport, the request sounded strangely; nevertheless, I complied. Whatever may be my objection to giving my portrait, I have none against giving my name.

"Monsieur lives?" I said where I lived, and my address was added to my name.

"Monsieur has number 309," explained the gentleman; "Monsieur will be informed by letter of the day on which his turn comes."

"And when is my turn likely to come?" asked I.

"Impossible to fix a date; much depends on the weather, and other circumstances over which we have no control. I should say in a month—perhaps even in three weeks."

"In that case, have the goodness to efface my name," said I; "I must have my cards on the last of the month at the latest."

The gentleman was sorry; but at this time of the year . . The whole person of the speaker, eyes, eyebrows, shoulders, hands, were eloquent in protestation of the vanity of my wishes. So without further parley I bowed myself out.

I spent a full hour in new trials; and, believe it or not, fair reader, but I say only the truth when I say that nowhere, either for love or money, could I get the promise of a photograph of myself, under fifteen days. Now, as it was already the 18th of December, and my card fell due on New-Year's day, a fortnight's delay placed me in the physical impossibility of keeping my word.

My best course was to quit the more aristocratic daily lounges, and try some less frequented neighbourhood, which possibly the fashionable epidemic had not yet attacked. With this hope I repaired to the Palais Royal. Here again there was too much of a good thing—rows and rows of photographs, and photographers' signboards stared at me from every corner. Like Yorick in search of a passenger from whom he might ask his way, I scanned the outward features of perhaps a dozen establishments, without seeing aught that could influence my choice one way or the other. At last I perceived this N.B. attached to a photographer's name. "Up at the seventh story." Eureka! cried I; no danger of competition from the lame and asthmatic here,—and up I climbed. I was received by a lady. I took it as a good omen. Women are more easy and pleasant to deal with than men. "Madame," said I, as soon as I could recover my breath, "I wish to have some *cartes de visite* done."

* We condense from an article in *Macmillan's Magazine* the above amusing sketch of an episode in the history of the "cardomania" in the French metropolis. The extract has been marked for insertion since April, but has been delayed from lack of space.

"Certainly," replied the lady, "how many do you— ?"

"Excuse my interrupting you," I continued, in an unsteady tone, "but I should like to know how soon you can take my likeness."

"Immediately, if it suits you—(I could have hugged the speaker to my bosom for these blessed words)—that is," pursued she, "should the light serve, which I rather doubt—really we have no afternoon. At all events I will go and inquire of my husband."

Alas! the light, such light as it was, December light you remember, did no longer serve. Such was the fiat with which the lady emerged from the glazed door of an adjoining closet, evidently the photographer's workshop. But, if I would return on the morrow about midday, I might make sure of having my photograph taken.

I was punctual to my rendezvous next morning. At three minutes to twelve by the time-piece of my photographer (to be) I had taken up a position in the lilliputian waiting room.

"Very poor light," observed the artist by way of salutation. "Let us make the most of it as it is, by looking sharp," said I. The man being apparently of my opinion, a few seconds were enough for him to suggest, and for me to assume a becoming attitude in front of the four cannon-like tubes which were to reproduce my respected person four times at once. "We are going to begin—perfect immobility if you please; keep your eyes steadily on the handle of the door; there." The operation began, and was done, or not done, in less than five minutes. So far my fair-haired lady was right.

In course of time, the photographer reappeared. "*Manqué*," said he, with a rueful face, "in all my experience I never saw such another abominable day for light," exclaimed the photographer. "However," he added, "suppose we try again." "Let us try again," said I; "is there any reason against my keeping on my hat and great coat? I am half frozen." "It would be a certain failure if I did so," was the answer; and so I had to part with my hat and upper garment, and sit in the draught unprotected.

Had the sacrifice only availed! but no, the second attempt was not more fortunate than the first. "It was enough to drive a man crazy," declared the perplexed artist, "all had come out beautifully, but no head! Useless to make any more attempts that day. Would I call again on the morrow, before noon." Of course I would; I had no choice but to do so.

Contrary to my anticipations, which were of the blackest, everything on the morrow went as smooth as oil. I had to wait comparatively but a short time; the light was tolerably favourable, and the likeness--so at least averred the photographer—had come out capitally. He promised that my *cartes de visite* should be sent to me on the 26th (it was then the 20th); I left a card with my address, and went home to nurse my cold in peace, thankful at heart at having got rid of my incubus on such easy terms.

The 26th came and went; and so did the 27th; and heaven knows how many more days might have come and gone without my giving a thought to the *cartes de visite*, for I happened to be very busy at the time, had not chance thrown me on the evening of the 28th in the way of my fair persecutress of the "five minutes" at the house of a common friend.

The first thing I did the next morning was to go and see after these blessed cards.

"Madam," said I to the lady, in whom I had seen a benignant influence on my first visit to the photographer of the Palais Royal, "as you have not kept your promise of sending me my *cartes de visite*, I have come for them myself."

"Your cards, sir?" replied the lady, evidently perplexed; "dear me, then you have not received my letter."

"I have received no letter," said I.

"Then you are ignorant of the accident which has happened."

"Accident? what accident?" cried I.

"Well, your glass, I am pained to the heart to say, somehow or other, was thrown down, and shivered into atoms."

I was literally struck dumb by this unexpected catastrophe. I gave a deep groan. The lady continued,—

"I did not lose a minute in writing to you. I am sure I made no mistake, for " (fixing her eyes on me) "you are Mr. Wolf, are you not?"

("Mr. Wolf!!!")

"You live in the Rue des trois Epées?"

("Rue des trois Epées!!!")

"I copied the address from the card you left us. Where has it got to?" searching among several which were stuck in the frame of the mirror. "Ah! here it is; I knew I was right."

I cast my eyes on the card she presented to me, and read, "Mr. Wolf, Pedicure, 70, Rue des trois Epées." It wanted but this. To have to begin, *ab ovo*, and to pass for a Pedicure into the bargain!

The lady was right; alas! the mistake was entirely my own. The fact was, as I explained to the lady, that I had a—I beg your pardon—a corn, which made me suffer martyrdom. One of my friends advised me to apply to an excellent pedicure, whose address he would send. He sent it; and, as my evil star would have it, his note, inclosing Mr. Wolf's card, was delivered to me by my *concierge* just as I was going out on my third photographic expedition of the 20th. I put the card into my waistcoat pocket, and inadvertently gave it to the photographer instead of one of my own.

I had the cause to be thankful that I was yet in time to repair my blunder.

"Madam," said I, with as much pathos as I could put in my voice, "I am pledged to give my *carte de visite* on New-Year's day; pray, madam, help me to do so. Name any price you think proper, but let me have my card."

"My dear sir," replied the lady, "be convinced that I feel for you; indeed I do; but you ask an impossibility. We are literally sinking under the weight of work; my husband is positively made ill by it. We had to refuse a good half of the applicants for cards, and—I would not own as much to anybody else, but really your situation distresses me—and even of those we have accepted, we shall be obliged to disappoint the greater number. Just take a peep into the waiting-room, will you? Full as an egg (and so it was). You see I speak the truth; why should I not? It is our interest to please the public—"

A moment of reflection convinced me that there was but one course left for me to try. I beckoned to a cab, drove home, packed my carpet-bag, drove to the Strasburg Railway terminus, and took a ticket for Bar-le-Duc.

Why for Bar-le-Duc? Because of all the places on this terraqnean globe Bar-le-Duc was the only one where I had a fair prospect of having my photograph done—in other words because there resided in Bar-le-Duc a friend of mine who was an *amateur* photographer, and on whose assistance, if alive and capable, I knew I could rely.

If ever a man was surprised at the sight of another, it was my friend at sight of me. "Just like me," he declared, "he never—"

I hastened to explain the cause and object of my present visit.

"But, my dear friend," he objected, "you could not have chosen a more unfavourable moment."

"Did I say that I had chosen it? A bit of straw driven by the wind is not more passive than I am in this affair."

"With the snow falling in this way," he pursued, "no hope of doing anything tolerable."

"Let it, then, be something intolerable," said I.

"Really, you are not in a fit condition to have your likeness taken; you want rest. Go to the glass and judge for yourself. You look like a ghost."

"Ghost or scarecrow, it does not matter; only for pity's sake take a photograph of me at once. I must be in Paris to-night; I have a paper to finish, and to send off by to-morrow's post."

Satisfied that he had done all in his power to enforce the claims of art, always foremost in his eyes, my friend, in spite of the snow still falling, and the false light, undertook with a good grace the task I demanded of him. It required all his skill and patience to bring it to a plausible conclusion. The likeness obtained after two hours' hard work, bad as it was, he pronounced to be as good as could be hoped for under the circumstances. It was far from a flattering resemblance certainly, but for that I little cared. I should without fail receive a copy by post, on New Year's day. I might rely on his punctuality: thereupon, with heartfelt thanks, I departed.

The same gentle influences which had accompanied me from Paris to Bar-le-Duc—snow, wind, cold, &c. &c.—favoured my return to Paris. I reached home more dead than alive. I tried hard to finish the paper I had engaged should be forwarded on the morrow, but in vain; I had to send instead an apology, which brought me in due course a good blowing up from the disappointed editor—one of the many perquisites of the trade.

The next day—the last of the year—was, I sincerely believe one of the most uncomfortable days of my life. Dire anxiety weighed on every hour of it. Do what I would, I could not bring myself to believe that the card from Bar-le-Duc would arrive on the morrow. Something must happen to it. What had occurred before might occur again; nay, possibly it was quite in the ordinary course of photographic events that the plate or glass should break, or, if the photograph was sent, it might be smashed by a railway accident, or the envelope containing it be dropped by some careless postman. Anything seemed more likely than that it should arrive safely.

It did, though to my inexpressible relief, and I hastened to carry it myself to its destination. The fair lady was from home; so I left it, carefully wrapped up, and addressed, with her *concierge*: and then, for the first time for fourteen days, I breathed freely.

In the evening I received the following note:—

"I regret very much to have missed seeing you this morning. Thank you for your card. It does not entirely satisfy me. You know I am extremely particular about my photographs; so do not be surprised should I ask you for the sacrifice of another five minutes. We will speak of that. Come and take a family dinner with us to-morrow, at half-past six. Mr. Paul, and Mme. Lorry, will be our only other guests. By the bye, they both think your likeness good, and mean each of them to beg you for one. So be amiable enough to bring some more of your *cartes de visite* with you. *A demain donc.* Believe me, sans adieu. Yours sincerely, ———."

The perusal of this note threw me into despair. And so, all the wear and tear of mind and body, all my loss of time, all my disbursements, were to go for nothing; to leave me at the point from which I had started! the stone I had lifted in the sweat of my brow recoiled on me! I took up the pen, *ab irato*, to say what?—anything but that I accepted the invitation—to say that I was ill, that I had been called away by a telegram, that —that—but of what avail any excuse? To procure me a respite of a week—say of a month, and then? Why, all the botheration would have to be gone through anew. No, there was nothing for it. To go and settle in the backwoods of America, or to take the world as it was, hobbies included, such was the dilemma which rose before me, clear and defined; there was no escape. It was for me to choose. I pondered long, pen in hand, and then wrote this answer:—

"Dear Madam,—I accept, with thanks, your kind invitation for to-morrow. I regret that my *carte de visite* does not meet with your approbation; however, I am at your service for any number of experiments in the same line—in fact, until the result shall satisfy you. I am much flattered by the wish expressed by Mme. Lorry and Mr. Paul. I have written for an immediate supply of half-a-hundred copies of my card to meet the requests of my friends. Believe me, dear madame, ever yours, sincerely obliged, ———."

Proceedings of Societies.

North London Photographic Association.

The first meeting of this society, after the summer recess, was held at Myddelton Hall, on the evening of Wednesday, September 18th. G. Shadbolt, Esq., in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the society:—Messrs. A. Seeley, Biddle, H. Simpson, H. J. Vachell, J. C. Brown, Gandy, and Captain Herne.

The Chairman introduced to the notice some specimens, chiefly illustrating the characteristics of different lenses, amongst which were some produced by Grubb's aplanatic and portrait combinations, and some by the new American lens, by Harrison, which has been stated to include an angle of 90°.

Mr. Dallmeyer showed some specimens produced by his triple achromatic lens.

The Chairman observed, in relation to the pictures by the American lens, that no accurate data had been furnished from which the angle could be calculated, but that any one familiar with optics, would readily conclude that the claim made of including an angle of 90° was entirely erroneous. The entire diameter of the picture did not appear to embrace an angle of more than 60°, and if cut in the usual way not more than 45° would be included. The lens with which the circular specimen of about five inches diameter, was produced, was stated to possess a focus of 2½ inches. That was doubtless from the back lens, and not a word was said about the distance between the lenses, so that nothing was suggested as to the equivalent focus. He had recently had a letter from Mr. Seeley, who stated that he was unable to give any very definite information, as Mr. Harrison declined to permit any inspection of the lens at present.

Mr. Dallmeyer observed, in relation to the question of a wide angle being included by an ordinary view lens, he wished it to be understood, that by using a sufficiently small stop any single lens might be made to give definition over a very wide angle, but no matter what form such a lens might have, it must present distortion of the marginal lines.

The Chairman then read a communication from Dr. Maddox, detailing some experiments with albumenized plates for transparencies. He had tried the effect of various kinds of acids added to the albumen and to the developer, and had come to a conclusion that phosphoric acid gave the richest tone.

Mr. Barnett exhibited a very good transparency by the resin process.

Mr. Hislop had recently been trying the resin process, and was so well satisfied with it, that he has given up all others. He used half-a-grain of common resin to each ounce of Ponting's collodion. His bath was slightly acid, just the same as he used it for wet plates, and one peculiarity of the negatives was their similarity to those produced by the same collodion when wet, with perhaps a little more detail.

Mr. Hill observed that one of the claims made for the resin process was its superior sensitiveness. Had Mr. Hislop found it so?

Mr. Hislop had not found it more sensitive than the other dry processes he had tried; but he thought that with the same exposure it gave more softness and half tone. Its chief advantage was simplicity, thus effecting a great saving of time in the preparation. He placed each plate, on coming from the nitrate bath, in a dish of water, and then washed it well under the tap, and allowed it to dry spontaneously. The plates were developed in the same manner as wet collodion, and came out very rapidly.

The Chairman said that the Abbé Despratz, in originally suggesting the process, had laid much stress on the film adhering well to the plate, a quality, which, however, had not been found to exist in practice.

Mr. Hislop said the chief difficulty he had found was the tendency to dry during development.

The Chairman said that probably a little glycerine added to the developer would be found to obviate that difficulty, if it did not at the same time cause fogging.

Mr. Hill asked how long Mr. Hislop had found the plates keep.

Mr. Hislop said he had kept some for six weeks without noticing any deterioration.

The Chairman called attention to a new and very simple contrivance for holding the plate during the process of development, recently brought out by Mr. Solomon.

Mr. G. Wharton Simpson had tried this plate-holder, and could speak in the highest terms of its value. It held the plate firmly and prevented the danger of stains, either on the plate or the hand.

Mr. Morley showed some negatives from plates prepared as suggested by Dr. Ryley. The plates were, after sensitizing and washing, covered with diluted albumen, thoroughly washed and dried. They were then coated with a one-grain solution of tannin, or gallic acid, and again dried. All the negatives were very clean, brilliant, and perfect; that coated with tannin was thought to possess a little advantage in sensitiveness.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 25th September, 1861.

M. Steinheil, of Munich, has succeeded in constructing another new lens on the principles laid down by the celebrated mathematician Gauss. His previous effort was noticed in the Photographic News about a year ago. Gauss had shown that it was possible to exactly combine two rays of different refrangibility, both for the centre and for the edges of the lens, while in ordinary lenses only the mean rays unite with a ray of different refrangibility, proceeding either from the centre or from edges, hence results chromatic aberration, which increases with the aperture. Gauss, in his new construction, had succeeded in removing this objectionable aberration, but there remained another apparent in the mean rays. Besides, the radius of curvature in the new lens is less than a tenth of the focal length, while in Frauenhofer's lenses, it was at least equal to a third of the focal length. These circumstances were calculated to inspire doubts as to the practical value of Gauss's lens. Attempts at constructing it failed. But the cause of failure arose from a misconception of the opticians. The calculations of Gauss refer generally to the whole extent of the visible spectrum; but to render them practicable, it was necessary to limit them to the principal mass of the luminous rays. The aberration of the mean rays could afterwards be destroyed by suitably selecting the thickness of the lenses; and it is by regarding all these considerations that M. Steinheil has at length succeeded in obtaining a lens which possesses all the qualities anticipated by Gauss. The first lens of this kind which has emanated from the workshops of this optician is an objective of 36 lines diameter, with a focal length of 46 inches. It well sustains a magnifying power of 300 to 400 times. This instrument has lately been examined by MM. Peters, Klinkerfues, and Listing, and they pronounce it very superior to a Frauenhofer of the same dimensions. This objective, although its radius of curvature is only double that of its diameter, is perfectly achromatic and aplanatic. M. Klinkerflues has been able to distinguish with this instrument, and also with a telescope of 49 lines diameter, the very indistinct companion of β in Orion, which he could never discover through a five feet Frauenhofer. M. Steinheil has also executed some lenses in Gauss's formula, with a much less focal length than that of ordinary objectives of the same aperture and he is in hopes of obtaining instruments much more powerful than the old ones, without its being necessary to increase the length of the tubes.

M. Eugene Garneri announces the discovery of a mineral collodion, which possesses extraordinary sensitiveness, and which appears also to promise retaining its sensibility for a very long time. His plan consists in enclosing the sensitizing agent (iodide of silver) not in a film of organic matter, changeable like pyroxyline, which is left by the evaporation of the ether of the collodion; but in a film of *silica*, that is to say, in one of the most unchangeable substances known.

This mineral collodion is prepared in the following manner: to a suitably diluted solution of silicate of potassa or soda, add sufficient diluted hydrofluosilicic acid to completely neutralise the liquid to test paper, or what, perhaps, is the better, to leave an exceedingly feeble alkaline reaction; a precipitate of alkaline hydrofluosilicate is produced, which floats in the liquor, which at this point is only an aqueous solution of silica, and remains perfectly fluid for several minutes, provided *the* alkaline silicate has been dissolved in a sufficient quantity of water.

To this liquor add a few hundredth parts of such soluble iodide as may be preferred, agitate the mixture so as to produce rapid solution, and then pour the liquid on a good filter.

In the course of a few minutes we have an aqueous iodized solution of silica, which serves to coat glass plates nearly in the same way followed for collodion. The glass plates are then arranged upon a perfectly horizontal plane; it is not necessary to wait for complete dessication, the operation is completed when the liquid has taken the consistence of a sufficiently firm jelly. When the siliceous coating attains the desired condition, it is sensitized, exposed, developed, and fixed, almost exactly in the same manner as wet collodion, with this advantage, that the plate, when sensitized, may be dried, and kept in the dark always ready for exposure.

Photographers who employ iodide of potassium or of sodium can prepare the silicious liquor by merely adding hydriodic acid to a solution of silicate of potassa or soda.

M. Garneri promises further details on the *modus operandi* on a future occasion.

M. Sahler states that he has obtained an instantaneous collodion, by employing iodide of iron in the nascent state, produced in the collodion itself. The results are always certain and superior to those obtained from the employment of the ferric iodide of commerce. He rubs up into a fine powder in a Wedgwood's mortar, some sulphate of protoxide of iron, the equivalent of which is 139, he also reduces to a fine powder some iodide of barium, the equivalent of which is 195. By mixing equivalent weights of these two salts in a suitable quantity of ether, double decomposition takes place; the iodide of iron remains dissolved, and the sulphate of baryta is precipitated. When filtered and added to the necessary quantity of gun-cotton, the collodion is ready for use.

PHOTOGRAPHY IN GERMANY.

Elberfeld, 16th September, 1861.

Dear Sir,—Since I last wrote to you I have received from several persons accounts on Laborde's addition of free iodine to the silver bath. They all agree with me as regards the excellent working of the baths treated in this manner. I need scarcely say, however, that I found the bath a little acid from liberated nitric acid. Dr. Schnauss writes to me about this matter: "In order to bring a fresh nitrate bath into working order there is no better means than to add some tincture of iodine instead of acetic acid. I must wonder however that the Abbé commits such a chemical fault in saying, 'One should think the iodine would combine with the silver, and so liberate nitric acid. But it is not so, the bath remains quite neutral even when heated.'"

The most simple chemical experiment teaches the contrary! Add one drop of alcoholic solution of iodine to a solution of neutral nitrate of silver in water: immediately a precipitate of iodide of silver falls down, and the solution shows an acid reaction from liberated nitric acid. It cannot be otherwise on any known chemical principles. It is therefore only the liberation of a small part of nitric acid which produces this favourable change in a fresh bath, which tends to give fogged and feeble proofs.

Another new process, that of Professor Balsamo, described in No. 154 of the Photographic News, has not as yet proved its applicability. It has been found impossible to get a trace of an image upon the paper prepared with the indicated cupro-phosphor-hydrochloric solution. One experimentalist believes phosphorus to be insoluble in hydrochloric acid. Should we, nevertheless, succeed in producing pictures in this manner, I think the process can never come into general practice, the phosphorus being a poisonous substance, and the sulphuretted hydrogen possessing such a disagreeable smell.

Recently much has been said about enlarged photographs of microscopic subjects. Professor Gerlach, of Erlangen, has sent some photographs of this kind to the Royal Academy of Berlin, with a description of his process. He makes first a microscopic picture of the small subject with a microscope, the construction of which he promises to describe at another opportunity. The small microscopic picture is enlarged by a quarter-plate portrait lens. The author has enlarged gubbings of Hipparchia Fanira, 1500 times.

Another well-known physicist, Professor Dr. Von Babo, of Frieburg, has sent me some stereoscopic pictures (in the usual size) of microscopic subjects. The most interesting is the enlarged copy of a fungus in the flower of oak, (Lohbluthe), having not more than a millimeter in diameter; the stereoscopic effect of these pictures when seen in the stereoscope is very remarkable; the ramification of the fungus appears like a large tree.

Dr. Schnauss publishes in the journal *Photographisches*

Archiv, an account on Major Russell's tannin process. For nearly five years past, a zealous follower of Taupenot's process, he now gives the preference to the tannin. The following are some observations he has made on it.

When pouring the tannin solution on the collodionized, silvered, and washed plate, often the whole film becomes brown; the only preservative against this is to wash the plate with salt solution and afterwards with water before pouring on the tannin solution. By this process all free nitrate of silver (which can *never* be completely washed out of the collodion film) is decomposed. The negatives become then very dense and pure.

When one takes the plate out of the camera back, the whole picture often is visible. This proves an important developing power of the tannin. The negatives tend after longer development, to become positive, the transparent shadows begin to darken. This inconvenience is mostly produced by the deficiency of acid in the pyrogallic acid solution. If sufficient of the silver solution—which contains the citric acid—is not added to the pyrogallic, the transparent parts of the negative will soon be fogged. For this reason I recommend to have a separate solution of citric acid in water which may be added, when necessary, to the pyrogallic solution.

The blacks of the negative become yet more dense than in the wet collodion process. This is one of the greatest advantages of the tannin over all other dry processes. Also the pictures are very clean, and without spots. If one exposes only a short time in the camera, one obtains very beautiful direct positives, which possess, after being varnished, a fine gloss like daguerreotypes.

I sometimes found the formation of small, black, round spots in the film, without any exterior cause.

Beyond the *utmost cleanliness* I recommend yet the following points for consideration:—1. The coating of the glasses with gelatine.

2. Spontaneous drying, and then the drying by artificial heat; and, finally, cooling of the plate before the collodion is poured on.

3. The coating of the plate with diluted salt water, after the washing off of the nitrate bath, and repeated washing with water before pouring on the tannin solution.

4. *The rapid and homogenous drying of the tannin film.*

5. The *rapid, homogenous* wetting of the plates before the development.

6. The just proportion between pyrogallic acid and nitrate of silver, conforming to a long or short exposition.

The composition of the silver bath and collodion is not very important, provided they give good dense negatives in the wet way.

If during the development too much silver solution has been used, especially when the exposition was short, one obtains often too great contrasts between light and shadow. The pyrogallic acid solution should always be fresh prepared by diluting some alcoholic solution of this substance with water. The alcoholic solution can be preserved during some time.

For some time past I use green glass in my dark-room instead of yellow, and find it very profitable, because one can better see and judge the density of the negatives. I can work in this room, with the most sensitive and harmonized chemicals without a trace of fog. I remark that no direct, only reflected light falls through the green windows.

PAUL E. LIESEGANG.

Photographic Notes and Queries.

PHOTOGRAPHIC VESSELS.

SIR,—Having experienced the advantages of vessels constructed of the highly carbonized compound of caoutchouc, termed *ebonite*, for chemical and electrical purposes; I may be allowed to call the attention of your readers to the valuable properties which such vessels would possess in a photographic point of view. Ebonite appears to unite in the most perfect manner, the negative chemical properties of glass or porcelain, and the non-liability to fracture of gutta-percha. It is attacked only by the strongest acids, is free from the tannin and other uncarbonized vegetable matter contained in gutta-percha, and is consequently without action upon the salts of silver, and other metals. Moreover, by immersing vessels of ebonite in the water or salt-water bath, solutions may be heated in them to a temperature over 212° Fahrenheit, or maintained at any required degree of heat. These advantages cannot, I think, fail to secure the adoption of *ebonite* for vessels required in photographic manipulation.

D. G. FITZGERALD.

September 23rd, 1861.

[We shall be glad if our correspondent can give us information as to the manufacturers of this material. We think it very probable that it might be found of much service in photography, and should like to try it.—ED.]

THE ELECTRIC TELEGRAPH ANTICIPATED.

5, *Aberdeen Park, Highbury, Sept. 21st.* 1861.

DEAR SIR,—In reading an old number of the *Guardian*, which was published on Tuesday, July 28th, 1713 (148 years ago) I found the following passage, and thinking that it might not be unworthy of notice in your valuable pages, I hope you will be kind enough to insert it.

"Strada, in the person of Lecrotius, gives an account of a chimerical correspondence between two friends by the help of a certain loadstone, which had such a virtue in it, that if it touched two several needles, when one of the needles so touched began to move, the other, though at never so great a distance, moved at the same time and in the same manner. He tells us, that the two friends, being each of them possessed of one of these needles, made a kind of dial-plate, inscribing it with the four and twenty letters of the alphabet, in the same manner as the hours of the day are maked upon the ordinary dial plate. Then they fixed one of the needles on each of these plates in such a manner that it could move round without impediment, so as to touch any of the four-and-twenty letters. Upon their separating from one another into distant countries, they agreed to withdraw themselves punctually into their closets at a certain hour of the day, and to converse with one another by means of this their invention. Accordingly, when they were some hundred miles asunder, each of them shut himself up in his closet at the time appointed, and immediately cast his eye upon his dail plate. If he had a mind to write anything to his friend he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence, to avoid confusion. The friend, in the meanwhile, saw his own needle moving of itself to every letter which that of his correspondent pointed at; by this means they talked together across a whole continent, and conveyed their thoughts to one another in an *instant* over cities or mountains, seas or desarts."

To those who are acquainted with the working of the common telegraph, and also of that invented by Professor Wheatstone, this will prove doubly interesting. To those who are not, a little explanation will be necessary. In the ordinary electric telegraph, the letters are indicated by so many movements of the needle one way or the other, viz., either side of a fixed point. But in Wheatstone's magneto-telegraph the needle points to the letters of the alphabet, which are placed *round* the dial in the manner described in the passage quoted above; and the electricity is gained by the rotation of a *magnet*.—I am, yours respectfully,

H. COOPER.

ARTIFICIAL LIGHT FOR PHOTOGRAPHY.—A method of applying artificial light to photographic purposes was recently patented, but has not been proceeded with. It consisted in combining the use of electric light or of gas light with Mortessier's mode of obtaining positives or positive photographs, photographic proofs, or impressions. By these means the artist can photograph without being dependent on solar light, and the artificial light used in this invention can be controlled, so that proofs may be obtained of various effects, and faulty negatives corrected; effects can be rendered more distinct by throwing an excess of light on parts where it may be necessary, and darks can be toned down by shutting off or intercepting the luminous rays by a screen.

Talk in the Studio.

The Holiday in the Woods.—An exhibition of works of art was recently opened in connection with the Cornwall Polytechnic Society. We notice that a silver medal was awarded to Mr. H. P. Robinson of Leamington, for his Holiday in the Woods, with which our readers are familiar. An award of £1 was also made to the Rev. F. E. Guttross of H. M. Ship Russell, for a series of stereoscopic views.

Panoramic Photography.—We have just been favoured with an inspection of a series of the most perfect negatives we have ever seen, taken by Mr. Sutton, in Jersey, on curved 9 by 7 plates with the panoramic lens. The angle included was from 90° to 100°, the subjects well chosen, the definition exquisite, and the negatives apparently without a spot or defect of any kind. Nothing could so effectually prove the facility and ease with which curved plates are manipulated than an inspection of these negatives, which are as free from mechanical or chemical defects as the best negatives on flat plates we have seen. Pictorially they are very charming, at least one of the number having fine natural clouds.

The Exhibition at Florence.—The Correspondent of the *Daily Telegraph* speaking of the Exhibition of Works of Industry and Art at Florence, says:—"The photographic gallery, already of an alarming size, is growing daily more extensive. Among some thousands of photographs there must be a good deal of rubbish, and, above all, there is an excessive collection of portraits, "*of no value to any but the owners.*" But there is also very much to admire, and I think photographers (generally an erratic race) might learn something by wandering to Florence. Among the best, I will mention two or three; but there is as yet no catalogue from which I can give the artists' names. The finest portrait is a full-length picture of the "King," in plain clothes. It is not painted, as I have seen large photographs in London, but remains in the usual unbecoming black and white; nevertheless, it is the King himself, the best likeness and the easiest *pose* of the many thousand effigies of Victor Emmanuel that one sees in Italy. There are some splendid architectural pictures, and some landscapes and portraits (done with wet collodion) of Allinary, of Florence. Duroni, of Milan, is also very strong, and there are many (nameless as yet) excellent views of Rome and Venice, two cities built to be photographed. An amateur, Mr. William Warren Vernon, displays one of the best executed and most interesting collections. Then there are photographs on cloth, some coloured in water colours, none in oil, and portraits of all sizes, shapes, and colours; and he must be a hermit and a solitary who cannot detect the likenesses of some dozens of his friends.

To Correspondents.

*** Messrs. Hope and Co.—We are requested to state that the firm of Messrs. Hope and Co., of Hammersmith, conduct business as usual. The announcement in answer to a correspondent in our last that the firm had ceased to exist was an error, the result of a misconception.

H. Cooper, Jun.—It is somewhat difficult to deal with a bath that retains a deep colour in spite of kaolin, animal charcoal, chloride of sodium, and citric acid. You may possibly find it yield to influence of light. Render it neutral by the addition of oxide of silver, and then expose to strong sunlight. The organic matter, to which the colour is due, will be thrown down, and you will probably by that means get a clean bath. Add a little nitric acid before using again. 2. The reason your cotton dissolved on trying the new sample of nitric acid was the presence of a larger proportion of water than you had before; the acid was, in short, weaker. The remedy is the addition of a larger proportion of sulphuric acid, the exact amount of which must be found by experiment. There are several varnishes which dry without heat. We have frequently used that sold as "crystal" with advantage; but it is not very hard, and requires care. Your interesting extract shall appear.

W. G. G.—In painting a screen with a landscape, for backgrounds, use oil colours mixed with as little oil as possible, using turpentine instead. Or use distemper colours; that is, mix the pigments with water and a little size. Unbleached sheeting calico is the best material for the background. 2. The best plan is to neutralize your chloride of gold as you require to use it; if, however, you have merely made it neutral it will keep very well in that state. In the passage to which you refer a few words have been interpolated by accident.

Builsah.—The provisions of the Amateur Photographic Association will, we understand, extend to India. We have inquired and are informed that they cannot undertake any expense or responsibility regarding the carriage of the negatives. The best plan, if others desire to join, would be for several gentlemen to send their negatives at one time. As yet we do not know much about the working of the system. We will let you know what we learn of its working when it has been established a short time. 2. A very stable iodizer, giving good results, is as follows: iodide of sodium 2 grains, iodide of cadmium 2 grains, bromide of cadmium from half a grain to a grain, dissolved in the smallest quantity of alcohol, to each ounce of collodion. 3. The lenses you have may be used for enlarging; the only additional apparatus you will require is a large camera, with a long extending body. The simplest plan is first to produce a transparency on glass from the original negative, and then an enlarged negative from the transparency. The process is too long to describe in detail here; but a little thought and experiment will enable you to succeed. Possibly we shall revert to the subject shortly. 4. On the whole we prefer the collodio-albumen process, and for India it would probably answer better than other dry processes. We shall have pleasure in receiving an account of your trip.

H. B. Y.—You do not state whether you mean collodion positives or prints from negatives. If the former, glass is the best material, if you are accustomed to cutting it to fit lockets; if not, use the enamelled iron plates. 2. In making oxide of silver continue adding the alkali until all the silver is precipitated. There is no danger of adding too much, as all excess is afterwards washed away. 3. You may make chloride of gold from the "gilder's dust" you have, by adding acid in the usual way, more than once described in our pages.

J. M.—A stereoscopic negative can be enlarged to 12 by 10 without serious loss. We cannot tell you the probable cost, nor the best place to get it done. We believe Mr. Samuel Fry, of Forest Hill, undertakes such commissions, you had better write to him. There are several persons engaged in enlarging by means of the solar camera for the profession, but we cannot tell you all their names. We may mention, in addition to Mr. Angel of Exeter, Smyth and Blanchard of London, and Webber of Taunton. An enlargement from a small print is comparatively worthless, it should be from the negative. A landscape lens may be used for copying. We are glad to help you with any advice in the pages of the News, but our engagements prevent us from writing long private letters, especially by return of post. Your print is interesting, but slightly under-exposed.

Robert H. Courlang.—Messrs. Beard and Sharp's process of printing on ivory is a secret, but we believe it is not patented. We do not think there is anything to prevent your practising and bringing a process of your own before the public. We shall be glad to see a specimen.

Mineral Carbon.—Cyanide of calcium is obtained in the form of an aqueous solution, by saturating hydrocyanic acid with hydrate of lime, and filtering. To the filtrate add dilute hydrocyanic acid until it no longer precipitates a neutral solution of sulphate of magnesia. Cyanide of calcium is decomposed with the utmost readiness, losing hydrocyanic acid by the action of the carbonic acid of the air, or by boiling. It can only be obtained in the solid form by evaporating the aqueous solution *in vacuo* over oil of vitriol.

D. L. I. is thanked. The hint shall appear.

R. Cooper.—We will write.

A Young Beginner in Photography.—A reasonably good equipment of apparatus with which to commence photography may be had for about £10. Sets of apparatus for less sums are advertized, but if you can afford it, don't get anything too common. A respectable dealer will best advise you. Most of the manuals for beginners give a list of requisites for a beginner. See that recently published by Mr. Hughes. We cannot mention the names of particular dealers here. The Photographic News Almanac for next year will be ready in November. A list of all photographic papers ever published would occupy too much space to publish here.

J. W.—Many operators state that they do not find any bad results from immersing plates in the bath which have a thin coat of albumen under the collodion. Some recommend coagulating the albumen, either by boiling water, protosulphate of iron, alcohol, &c. Our only experience in the matter leads us to discard the practice.

Francis Player.—The cause of your failure is simple. The cotton dissolving is the result of acids *too weak*, not too strong. Your acids are much too weak; you may try them in the proportions you state, but without any water. In the second formula, as you state it, you have taken rather more than a third of the proportion of nitre, and only one-sixth of the fluids, and of course obtained a paste instead of a fluid. The cotton will do perfectly. See recent articles in our pages on this subject in the "Dictionary of Photography." Try the formula we recommend, and you will not fail.

F. Lane.—Unless you can supply us with a piece of the glass, we cannot well assist you, as a large pane is inconvenient for use with the spectroscope.

T. R. H.—If iodine be applied to the silver stains on a cloth coat immediately, and then cyanide or hypo, they may be removed. But if they have been done some time, we fear there is no chance of removing them.

W. Henry.—The stains from the draining of the silver solution in wet plates, long kept or exposed, are very troublesome. They are more frequent with an old bath than a new one. The use of an alcoholic collodion lessens the probability of their occurrence. The only certain method of preventing them which we know, is to wash the plate before development with a small quantity of distilled water, which should be added to the developer. We have generally found this answer.

Wm. Bartholomew.—We shall have much pleasure in trying a few plates if you send them. With the characteristics you describe the process must be very valuable.

H. W. B.—The use of a bath with too much acid, or of an old collodion, for collodion positives, will have a tendency to produce excess of contrast in the picture. The details in the blocks will come out very tardily, even when the face is fully done. If you develop in a dish you must often renew the solution, as its continued use over and over will weaken it, and so cause it to develop imperfectly. Possibly your bath is getting old and weak. A very acid bath causes the film to have a tendency to leave the plate.

Several letters in type are compelled to stand over till next week.

Braisueeth Avoia, Narberth, James Tulley, G. Smith, J., G. and J. H. G., Caxton, and others, in our next.

R. Harmer.—We have received the paper, and will take an early opportunity of trying it.

Advertisements and Communications for the Publisher for the current number, to be addressed to the Office, 32 Paternoster Row, not later than 3 o'clock every Thursday. Post-Office Orders are to be made payable to Mr. Thomas Piper, at the Money-Order Office, St. Martin's-le-Grand.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 161.—*October* 4, 1861.

PROTECTIVE TAXES FOR PHOTOGRAPHY.

Our columns have recently been the vehicle for expressing a most unusual desire—the desire for taxation. Whilst a large portion of the intelligence and energy of our day has been directed to the removal of all fiscal impediments to progress, and the promotion of free-trade, it is somewhat startling to find any members of a class proposing that they themselves shall be taxed by the State. The desire for protection is not unusual, but it generally finds expression in pointing out how somebody else should be taxed; how art, industry, commerce, the State, may be benefited by imposing taxes on some other and competitive branch of trade. But here the taxes are desired for personal application.

The letters of Mr. Swatridge in a recent number and in this, and the letter of W. B. N., in another column of this issue, suggesting taxation for photography, each in different directions, are but the expression of a desire to be protected from unscrupulous competition. We think, however, the means indicated are wrong in principle, and would be inefficient in practice. Let us consider both plans briefly, in detail.

Mr. Swatridge proposes, in order to suppress the vile dens where the art is disgraced, and its practice simply a vehicle for extortion, that a yearly tax, for a licence, be imposed upon all who practise the art professionally. Such an idea implies at the outset a money estimate of intelligence and ability. Our correspondent may not intend it in such a sense, but it is nevertheless implied in it. The idea is therefore, most erroneous and unfair in principle: for centuries past that notion, at one time entirely interwoven with all Governmental schemes, has been gradually undergoing the process of elimination, and it would scarcely answer to return to it in reference to photography. It would be entirely inefficient in practice, because wrong in principle. The ability to pay such a tax would be no guarantee whatever of either ability or respectability. It is true such a tax might prevent the accession to the professional ranks of a few "needy villains," who now find the art a cheap pretext for their nefarious practices; but in regard to many of those already in existence, the more unscrupulous they may be, the better they can afford to pay for the permission to practise. We have repeatedly suggested the great advantages which might be derived from the existence of a photographic school or college where pupils graduating could acquire a thorough knowledge of the chemistry, art principles, and manipulatory details of every branch of photography. Such a college, might confer degrees and grant diplomas, which should be a guarantee to the public of the ability of those possessing them, and thus afford an effectual protection from the necessity of dealing with bunglers. In the absence of such a college, we can conceive that a society might be established with power, if not to impart instruction, at least to institute examinations and grant certificates of merit, which it might be an object of ambition to aspire to. Other methods might be suggested by which the honourable and skilful practice of the profession might be protected. Any scheme which guaranteed increased culture in the profession would receive our hearty approval. But the mere establishment of a prohibitory tax we should regard as wrong in principle, and inefficient and irksome in practice, and we should feel it our duty to give it our unhesitating opposition.

The proposition of W. B. N., in another page, to establish a penny patent, or copyright, for photographs, is more plausible. Our correspondent proposes that a penny adhesive stamp should be prepared for affixing to photographs, a copyright in which is desired, and that it be felony to copy any photograph to which such stamp shall be attached. We almost fear that if this proposition come under the attention of the Chancellor of the Exchequer, it will be suggestive of a source of revenue too tempting to be neglected. When we contemplate the hundreds of thousands of album portraits which are now published and sold, we feel assured that a very large revenue might be derived from such a tax. We are not, however, sufficiently patriotic to see it put in operation. We object to it on principle. There is an implied contract at all times between a Government and the people, which binds the former to protect the property of the latter. One purpose of the revenue derived from the ordinary sources of taxation is the administration of those laws which protect property. We object, therefore, to the notion of photographers paying an especial tax for the protection of their property. The picture of whatever subjects a photoprapher may produce, costs him something, and becomes his property; and we hold it a duty of the state to protect that property, without the payment of any especial fee beyond what he pays in common with his fellow-citizens. Class taxation is opposed to the whole spirit of the age; and a tax upon anything contributing to the elevation and cultivation of taste, as photography does, would be most odious.

Photographs merely claim from the Government the same protection which is now awarded to similar property, a copyright, such as is possessed by pictures and books. In the Bill brought before the House by the Attorney-General during the last session of Parliament, for improving the law of copyright in works of fine art, a recognition of the claims of photography was made. Photographs were classed amongst pictures, and negatives were placed in the same category as copper and steel-plates. The Bill will be doubtless brought before the House again next session. If photographers are concerned to protect their productions, let them exert themselves by bringing as much of the "pressure from without" as possible to bear upon Parliament. Let those who have influence with members, use that influence to secure their support in the House, and let all interested in the matter show their interest when the time comes by petitioning.

The further suggestion of W. B. N. as to rendering the possession of a licence necessary to all travelling-photographers, perhaps possesses more justice. It has generally been recognised that those classes who escape the ordinary taxation, falling upon persons with a fixed residence, should pay some equivalent, for the possession of a hawking-licence. How far the number of photographic hawkers renders the question one of importance; or how far the strict administration of existing laws would bring travelling photographers within their operations, we cannot offer an opinion.

THE ART CLAIMS OF PHOTOGRAPHY.

We may very well leave this question for the present with the exhaustive consideration it has received. Before entirely quitting the subject, however, we cannot forbear making brief allusion to the recently published letter of M. Silvy, in reply to the first letter of M. Claudet, which appeared in the society's journal. As our readers are aware, at the outset of the misunderstanding which occurred between her Majesty's Commissioners and the society, M. Silvy addressed a letter to the Council of the society, stating that whatever decision might be come to by the Commissioners, he should demand admission for his productions into the mechanical department, and affirming emphatically the essentially mechanical character of his art. M. Claudet commented in forcible terms upon the singular position thus claimed, and the reasons by which it was supported. M. Silvy now replies to M. Claudet in a courteous and well written letter, ostensibly defending his former position, but in reality yielding the whole question in dispute. He says:—

"I accepted the department which the Royal Commissioners had given to photography (that is to say, the mechanical one). You find the position assigned to photography unworthy of it; you protest, and demand for it a classification with the Fine Arts. Let us, then, examine frankly and calmly, if you will, the subject in dispute. I also assert that photography is worthy of occupying in art an elevated rank. I also assert that this art requires not only mechanical aid (which is the fundamental basis), but also thought, taste, judgment, and tact; but I imagine that if, for that reason, it holds position amongst the arts, it has not one amongst those properly called the Fine Arts.

"All your arguments prove that photography is an art. Irrespective of the excellence of the machines and accessories, the artist who practises it must, to merit that name, prove his talent, ability, taste, and sentiment; but there is one quality which you do not cite, because, in fact, it is not indispensable to photography, that is to say, Genius, the genius which invents, creates, composes, and which imprints on its works the immortal seal of the Fine Arts. Fine amongst all arts. This distinction is not new. The ancients recognized it. It is from them that it comes. The Greeks, more than any other people, animated with the sentiment of the beautiful (a sentiment elevated amongst them to a religious rite), personified the Fine Arts under the symbolical figure of Apollo, who combined all:—

Appollo, God of the Fine Arts,
Whose forehead shines as the Home of Genius,
Whose lips open not but for the sublime songs of poetry,
Whose fingers draw from the lyre melodious sounds or stamp of the marble the expression of his thought.

"Ages have passed, and the Fine Arts ever flourish with the same brilliancy. Poetry and literature, music, sculpture, painting, and architecture, are alone the Fine Arts. Every other, according to its nature, is divided into liberal, mechanical, or industrial arts, &c. These have acquired in our time sufficient importance that no one can blush at being classified among them. Besides, the classification exists from time immemorial; have you sufficient pretensions to overthrow it? You are, you say, something more than a mere machine; you have, moreover, talent, taste, mind, feeling. I am happy to acknowledge it; but all that fills not up the gulf which separates photography from the Fine Arts. Fine Arts create. Photography copies. The difference between the two is so clear, so evident, that it is unnecessary to dwell on the point. What photographer would be foolish enough to claim a place with Raphael, Michael Angelo, Rubens, and all the glorious names which history has left us?"

If this be not a complete cession of the whole question at issue, it is something very like it. Photography is art, but it is not *fine* art, because it "copies" and does not "create." Thus the art that copies is not fine art. Alas, then, for Apelles when he painted Alexander! He copied what he saw, he did not create. Alas for a large proportion of the productions of the great masters from his time downwards! Alas for Vandyke and Holbein, Sir Peter Lely and Sir Godfrey Kneller, Sir Joshua Reynolds and Sir Thomas Lawrence, and a host of others, who, like them, have been chiefly portrait painters. They have copied, not created. Alas for some of the most distinguished names enrolled in the Royal Academy of this day, they are portraitists: they copy, not create!

But since M. Silvy makes the claim of photography to rank as a fine art rest on this distinction, have we not a right to press him a little closer for definitions? What is creation in painting? If we accept Locke as our guide in philosophy, and repudiate the notion of innate ideas, every painting must be a copy of something. It may be a combination of many things, but all its parts must have been copied from something. If all the ideas in the mind are the result of impressions from without, then this creation is but combined copying. But this is bordering too closely on the region of metaphysics, and we will not pursue the argument.

If M. Silvy's definition as to the right application of the term "fine" to art be correct, then painting and sculpture both, so far as they are "imitative" or "copying" arts cease to be fine arts, and section IV of the International Exhibition would almost cease to have an existence. It is quite clear that such a distinction is altogether inadmissible, and would be unhesitatingly repudiated by those who already hold an undisputed position in the fine-art circle. The fact is, M. Silvy does himself injustice. The pictures of few photographers have higher art claims than his, and it is but the pride of humility on the part of the artist, to rate them as mechanical productions.

The position of photography has yet to be recognized. The story related some time ago, in a contemporary, is so apt an illustration of the case, that it might have been coined for the occasion. When the letter of M. Silvy was received by the Council of the Photographic Society, the president, it is stated, asked, "Who is Silvy?" M. Silvy, as it is well known, is one of the most talented and successful photographers of the day; but he is young, too young, and too recently established, to be known and recognized by an august conservative tribunal. Photography, one of the most wondrous discoveries of the age, has achieved the most brilliant results, and made the most astounding progress. But it is young—too young to be recognized by constituted authorities as an equal amongst the fine and graphic arts. Our correspondent, R. A., now practically assumes that position. He does not even doubt the capabilities of the art; he merely denies that it has yet made good its fine-art claims.

Well, all this simply constitutes a public challenge to photographers to make good the claims of their art. Her Majesty's Commissioners, we are assured, do not, in assigning to photography the position they have done, assume the position of a tribunal; they merely accept things as they find them. Photography has not yet received recognition amongst art authorities as a fine art. Once more, then, we urge upon photographers to make such a display at the forthcoming Exhibition, as shall set the question at rest, once, and for ever.

Scientific Gossip.

Whether the actual change undergone by chloride of silver upon exposure to light is as simple as some persons imagine, there may good reasons to doubt. The subject is one of great difficulty to decide one way or another, and several of the phenomena noticeable when the discoloured chloride is treated with reagents will admit of equally clear interpretation according to two or three different theories. One of the most recent writers on this point with whom we have recently become acquainted is the great Dutch chemist, Mulder. In a very elaborate research on the various phenomena connected with the formation of chloride of silver by precipitation (on which apparently hacknied subject he has written a good sized volume, full of interest and novelty) this experimentalist has given a very excellent resumé of the extent of our knowledge of this valuable photographic chemical, and has contributed a vast number of new facts which tend to clear up certain obscure points of its history. The well-known chloride of silver, as ordinarily precipitated by hydrochloric acid or a soluble chloride from a solution of nitrate of silver, is a very spongy precipitate; indeed, there are few chemical compounds like it in this respect. It appears as flocks, the particles of which retain their coherence even after strong agitation of the liquid in which they float about, and they even resume that coherence if it has been momentarily disturbed by stirring the liquid. The smaller particles of the precipitate, which float about in the liquid, are taken up in that spongy mass more or less in the same way that the flocks of albumen render clear a turbid liquid. An application of heat produces movement in the liquid, and whatever produces motion brings the smaller particles in contact with the more flocculent ones, whereby, while the liquid is rendered clear, the smaller particles are taken up by the larger. The liquid, after shaking, does not, however, at first become perfectly clear; it is even optional with the operator to render it more or less clear as he may desire. If, after the addition of common salt to the silver salt, some of the latter is still left unprecipitated, a more coarsely flocculent precipitate is obtained; if now a fresh portion of the solution of common salt is added and the liquid briskly shaken, the first-formed large flocks take up very readily the large number of smaller particles of chloride of silver produced by the second addition of common salt, and the liquid isrendered perfectly clear.

Chloride of silver is soon discoloured by light, being rendered violet coloured and heavy, whilst some chlorine is set free. According to Pohl, chloride of silver, which is precipitated at a temperature of from 60° to 80° C., is not discoloured by light for many days if it remains under the surface of the liquid, kept at the same temperature. The same writer states that the discoloured chloride of silver becomes, under the same circumstances, somewhat more white.

The existence of a subchloride, Ag_2 Cl, is assumed by Wittstein in the discoloured chloride of silver; he affirms that it is not attacked by nitric acid, and that it is decomposed by ammonia into chloride of silver, which is dissolved therein, and into metallic silver, which remains undissolved. In reference to this, Dumas says that the quantity of subchloride which gets formed in this decomposition is very small, and the quantity of chlorine set free very small also. Rose even goes so far as to assert that it is impossible to find any difference in the weight of the white and discoloured chloride of silver, when even a very sensitive balance is used. This statement is, however, disproved by Mulder in the following experiment. A quantity of pure silver, weighing exactly one gramme, was dissolved in nitric acid, and precipitated by a solution of common salt, added in precisely sufficient quantity to obtain the point of chemical neutrality —there being, therefore, neither excess of silver, nor of chlorine. The bottle containing the precipitate was exposed to light, and sufficiently shaken from time to time to discolour as much as possible the particles of chloride of silver. Upon testing the supernatant liquid for chlorine, Mulder found in it as much as would unite with 6·25 milligrames of silver. Now since 1 gramme of silver forms 1·33 grammes of chloride of silver, the 6·25 milligrammes of silver required to saturate the chlorine set free in this experiment, represent 2·06 milligrammes of chlorine. In case the whole of the chloride of silver had been converted into subchloride of silver, the half of 0·33 gramme of chlorine, that is 0·165 gramme should have been set free, whereas in this experiment only 1-83rd of the whole of the chlorine present had been set free, showing that the decomposition, even under the most favourable circumstances, is very slight. Enough chlorine, however, is evolved to be easily detected by a chemical balance, as in the above experiment it amounts to 2·06 milligrammes; and chemists are in the constant habit of weighing to a tenth of that amount.

Mulder states it as his opinion, that the violet coloured matter formed, when chloride of silver is exposed to light, is a mixture; part of it is perfectly soluble in liquid ammonia, while another part of it gets decomposed by ammonia, of which part again is rendered insoluble, the latter being metallic silver.

Chloride of silver which had been precipitated from a solution of nitrate of silver by means of common salt, and which had been exposed for some time to daylight was carefully freed from the supernataut liquid, and liquid ammonia was poured over it. Nearly all was dissolved, a small portion only remaining insoluble after having been in contact with excess of the alkaliue liquid. This small portion exhibited the same colour as the powder of minutely divided silver, as it is separated for instance by precipitation by formic acid: it did not possess any violet tinge, and therefore the violet colour of discoloured chloride of silver cannot be attributed to this substance. The metallic particles, insoluble in liquid ammonia, are exceedingly minute, few of them being of sufficient size to be retained by a filter. They are soluble in nitric acid, (the violet chloride it will be remembered is insoluble in this acid,) and the solution is precipitated by common salt; these insoluble particles are therefore metallic silver.

The solution of violet chloride of silver in ammonia gives rise, besides these particles of metallic silver, to a colourless liquid, which being supersaturated with nitric acid, yields again pure white chloride of silver, all the violet colour being gone. The following is Mulder's explanation of these phenomena:—The chloride of silver, AgCl, is reduced in small portion, by daylight, to the state of subchloride, Ag_2Cl, which has a violet colour, chlorine being set free. If to this subchloride, Ag_2Cl, ammonia is added, it then yields a colourless solution of chloride of silver, AgCl, the other portion of Ag being left behind in the form of an insoluble powder. Even on being warmed with it, nitric acid does not change violet-coloured chloride of silver to white; chlorine water, however, produces this effect instantly. The reason why chloride of silver which is so readily changed by daylight into subchloride, is not totally changed iuto it, is entirely due to the chlorine which is set free. An excess of chlorine is au impediment to the formation of the violet material.

Such in a few words is Mulder's view of the interesting and important reaction which takes place in chloride of silver when under the influence of light. Coming from so eminent a man, these opinions are deserving of every attention; but it must not be forgotten that experienced chemists in our own country, have given it as their deliberate opinion that the theory of the existence of subchloride of silver has been assumed upon insufficient grounds, and that all the hitherto observed phenomena produced by the action of reagents upon the discoloured chloride of silver can be equally well explained upon the assumption that the action of light upon the chloride of silver is simply to split it up into its two elements, silver and chlorine. Spiller's experiments on this subject, executed with his well kuown care aud acumen, appear decidedly to favour the latter view of the decomposition.

CHLORIC ACID IN THE NITRATE OF SILVER BATH.

BY M. MC. A. GAUDIN.

For a nitrate of silver bath to act well with all kinds of developing agents, it must be acid, but only in the slightest degree possible. I have previously shown that the acids at present employed, acetic aud nitric, yield variable results, which are due to their volatility and to their decomposition in presence of the ether compounds which are formed in the silver bath by the action of a high temperature. It is this fact which has induced me to employ a fixed and stable acid which would not, under any circumstances, produce a precipitate.

Under this relation chloric acid occupies the first rank. The chlorates are soluble like the nitrates, and when a silver bath is once properly acidulated with chloric acid, it always retains the same acidity, notwithstanding the concentration of the bath, or even its complete dessication.

Chloric acid is obtained from chlorate of baryta; it is rather costly, but so little of it is required for the purpose here indicated, that the price is no object.

After making a saturated solution of chlorate of baryta, sulphuric acid is added to it so long as a precipitate is formed. This precipitate is sulphate of baryta, and the filtered solution is chloric acid in a state of dilution fit for use.

After preparing a neutral silver bath solution, I employed it for obtaining proofs which came out well with a pyrogallic acid developer more strongly acidulated than usual. Upon the additiou of ten drops *per litre** of chloric acid, the silver bath reddened litmus paper in a very marked degree, and the negatives obtained with the bath thus modified came out well with the same time of exposure. I afterwards increased the quantity of diluted chloric acid, to the extent of five per cent. of the volume of the silver bath. A notable dimiuution of seusibility was the result, but infinitely less than if I had added diluted nitric acid in the same proportion.

The diminution in sensibility appeared to me exactly similar to that produced by acetic acid, and this induces me to say that diluted chloric acid is the best agent for acidifying nitrate of silver bath solution.—*La Lumière.*

Photographic Tourist.

MY FIRST PHOTOGRAPHIC TOUR.†

We rose early, and did what you would call a hard *day's* work before breakfast. Yes, before breakfast, for well do I remember how the gloom of coming night shrouded the town, a tedious hour or more before there was any prospect of that same breakfast making its appearance; nor do I forget how grim despair's sickening and wearying heralds held us in thrall as the misty veils thickened about us, and that first meal still loomed faintly in the distance.

The day in question began, and continued, thus:—In the first place I hung out upon the door-post our unglazed specimen case; thereby attracting a group of indolent loiterers, whose remarks, made in the most audible of stage whispers, were as freely applied to my blushing and uncomfortable self as to my specimens. In the next, I proceeded, with no little nervous trepidation and anxiety, lest all should not go right, to get ready for the much prayed for customers, by cleaning and buffing some plates, &c. Perhaps you never rolled up your shirt sleeves on a hot summer day, and bobbed to and fro, to and fro, for no end of time, over Daguerreotype plates until your wet hands clung to the handles of your "buffs," and tickling, trickling sensations crowded over every half inch of your hotly glowing person. If you never did, why bless collodion for the fact, and subscribe at once, if it be not too late, to the Archer Testimonial Fund.

Victimizing my wife as a sitter, I proceeded to rehearse my part for a first appearance in the character of a Daguerreotypist, in order that any possible influx of patrons might not find me unprepared for their reception. Of course things went wrong, they always do when there is any special and particular reason why they should not do so. I placed my "buffs" out of doors in the sun to keep them warm and dry, forgetting the dust. I had forgotten not only the dust, which was easily brushed off again, but the greasy fingers which might be passed over the scrupulously cleaned leather, just to "feel how smooth it was," when my back was turned. The plate coated unevenly over the iodine. My box containing the "quick," or bromide of lime, had not been made properly air-tight, and the bromine had considerably escaped, so that I found it almost impossible to get any half-tone in the pictures. I forgot to filter the mercury so as to remove the oxidized surface. The thermometer attached to my mercury box had got broken, so that I had no idea of the heat, and the pictures were all "peppered" from excess of mercury; my fingers damp with excitement and perspiration caused stains at the spot where they touched the plate in placing it over the mercury. When I finally got a picture near the mark, my first batch of "gilding" was spoiled by pouring the hypo into the gold instead of the gold into the hypo. Making up some "sel d'or," which I luckily had, I proceeded to gold, or "enamel," as I had been taught to call it, and as I anxiously watched the picture improving in colour and brilliancy, I continued the application of heat until up suddenly flew the surface, cracking and exfoliating. I made one blunder after another, until confused, bewildered, and teazed, past bearing, I sat down in the little dark closet I had extemporised and cried and sobbed like some poor, sick, scolded, heart-broken little child. I could not, despite my utmost care, get such pictures as I could hope would find purchasers, and without such, what on earth could I look forward to? Think of this before you laugh at me, my dear reader.

From this unmanly fit of weakness I was aroused by the glad voice of my exultant little partner, announcing joyously "*Our first customer.*"

Well, perhaps our first customer was not absolutely and perfectly beautiful, observing her red hair, her small, round-tipped, highly polished nose, her slit-like eyes, and her gash-like lipless mouth; any cold, uninterested observer might have called her, I don't doubt, a very vulgar, ugly, talkative, little serving-wench. I called her an angel, a most radiant being, full of *spiritual* beauty!

"Wott'll yer take to do my likeness, mister," said this "radiant being," as, having smoothed my damp, straight hair, and wiped the tears and perspiration from my flushed and burning face, I bowed myself into her glorious presence. After patronizing me to a very liberal extent in promises, and evincing in other ways, the condescending nobility of her nature, she sat for a "five-and-sixpenny" picture, for which she was to call again in an hour or two. I won't say much about the picture I got, it was certainly better than its predecessors, but, well, I hoped it would pass, and waited anxiously for the "radiant being's" second visit; for till her visit and her money had been paid we could but remain foodless.

Now to secure another hope, apart from that of selling the Daguerreotype. I set to work and made a sketch from it in india-ink, and giving this a few washes of colour, succeeded in completing it exactly ten minutes after the second hour had passed and her angel form was due. But three hours passed, and she came not; three hours and a half passed, and still the spiritual beauty of her presence was desired: "Shades of evening close not o'er us" said we, in vain, for they would and did do it, and yet we mourned her absence. Nearly all the the light of our room had gone out of the window, and thick darkness had seized upon its corners, when from the gloom near the door came a voice of music to our eager ears, crying pantingly—

"Oh! lor, arn't I had a run for it, and no mistake, mister!"

We borrowed a light from our landly, for candles we had none. The light of those angelic eye-slits fell upon my Daguerreotype—the voice of music denounced it. Oh! what a sinking of heart was there, my readers. From those slits aforesaid a glance illumined my sketch, the voice of music uttered melodious sounds of praise and pleasure. Then! what a leaping in the breast was there, my readers. And so I won my "breakfast" aud we sat down to partake of it with light and grateful hearts, and going early to bed, slept so long and sound and dreamless a sleep, that it was like a foretaste of our death-slumber.

* A litre is about 35¼ fluid ounces.

† Continued from p. 414.

The next day was market-day, Friday, and my show case, being in Conduit-street, leading to the market-place, was surrounded with numerous admirers immediately it appeared. The clattering of horses' hoofs, the screeching and squeaking of pigs, the rattling of carts, the loud-voiced recognitions and salutations of a crowd of pedestrians, the bleating of sheep and the lowing of cattle, &c. &c., made this day a strange contrast to its predecessor, when the street was so quiet and deserted that I feared my presence in the town would not be generally known in much less than two years, if I depended for its announcement upon the exhibition of my specimen case. It turned out quite a bustling busy day with me too, for ere it closed, I had taken and finished no less than eight pictures, all more or less satisfactory; of a farmer with blue coat and brass buttons, cord breeches, top boots, and a broad brimmed fluffy beaver hat, of two farmers in all the fashionable grandeur and style, and with all that haughty supercilious air too, of Regent-street fops, of another farmer in a loose frock-coat, the tails of which flapped playfully against his heels; of another fat old farmer who fell asleep before I could uncap the lens, of two farmers' daughters whose lofty air of condescending superiority highly befitted their aristocratic pretensions, and who drove off in a cart with two small porkers; and of one farmer's wife, who promised that on the next market day no end of other farmers, and farmers' wives, and farmers' daughters, should patronise R. A S.'s Chelmsford "establishment," IF *her portrait "turned out a good one."*

For the remainder of that week we were unvisited and alone. At the beginning of the next I made a step upward in the esteem of my neighbours, being visited by one of the awfully mighty ones of Chelmsford; the great ———, who lived in a large stately house standing in the London road, but which house was somewhat like ———'s person and character, more wide in surface than great in depth. This last remark, however, may arise from prejudice, for I did not please him, and I did displease him.

Soon after we were again penniless, and in despair, so I sat down and exhausted our supply of note-paper and envelopes by writing certain circulars, which set forth how, R. A. S. "having achieved a London reputation" (heaven forgive me for lying) was "making a short stay," &c. &c., and these circulars we ourselves delivered at the doors of the more respectable-looking houses. The effort produced nothing. We passed a day without food, when it struck me that by personally exhibiting a few specimens at some houses outside the town I might perchance get something to do "at their own houses." Accordingly off I started, empty and melancholy, on my errand. Several times I advanced as far as garden gates, and found my courage ooze away before I could open, them. At last seeing a lady in a garden I made a desperate effort and began to address her, but, I suppose the desperation of the attempt found expression in my face, for no sooner did I open my lips than the lady cried hurriedly, "Oh dear no!" and retreated with evident affright into her house, not only shutting, but, as my ears informed me, rapidly bolting the door also. My next application was more successful: a kindly, venerable old quaker lady listened to me with a pleasant smile full of encouragement, and bade me come and "take" her little boy on the morrow, in water colours.

In the morning I went, sat down in the cheerful dame's neat and cleanly little parlor, finished my sketch, received its price and a glass of home-made ale. and bade my patron adieu. My wife met me on the road, anxious to hear how I had fared. I exultingly showed her the money: we purchased food on our way home, and ate it directly afterwards.

In a day or two we were as badly off as ever, and no new chance seemed likely to save us from starvation, when—Oh! jubilee!—a letter from London informed me that a picture painted and left with a dealer before I started had sold for £20, a cheque for which—short the amount of commission—was duly enclosed. R. A. S.

PHOTOGRAPHIC PORTRAITURE.

BY M. DE VALICOURT.

It is most important that exposure should follow the preparation of the glass-plate, for if it be delayed too long, the collodion film, already partially dried, will lose a great portion of its sensibility. The operator will therefore take care to have everything ready beforehand; the pose to be given to the model, the focussing, and all the other preliminaries of exposure, so that at the last moment nothing remains to be done except to take a rapid survey of the preparations. It will be prudent to allow no more than two or three minutes to elapse between the sensitizing of the plate and its exposure in the camera.

The time of exposure is governed by a crowd of circumstances, the principal of which are, the greater or lesser intensity of the light, the length of the focus of the lens, the greater or lesser distance of the model from the lens, the photogenic quality of its colours, and the comparative rapidity of the collodion. All these elements must be taken into consideration upon determining the time of exposure. Nevertheless we must not forget that the collodion process is perhaps the most rapid of all those employed in photography. With this fact in view, and taking into consideration all the varying circumstances mentioned above, we may fix the extreme limits of exposure between two and sixty seconds. Doubtless a very wide margin exists between these extremes, which must be left to the discretion of the operator, but a little experience will soon enable him to attain the precise point: it is better, however, to err on the side of excess of exposure.

A good negative always presents a slightly solarized aspect when viewed by reflected light; viewed as a transparency, the darkest portions of the image should be of a brown rather than of a blue hue.

An incomplete negative, on the contrary, betrays itself as a very fine positive when viewed by reflected light; but as a transparency, the dark portions of the image are weak, grey, without vigour, or half tones, and yet there exists a harsh contrast as a whole between the lights and darks.

A negative upon albumen must never present the same intensity of tone as one upon collodion. We insist upon this point, to prevent operators falling into error, from being accustomed to operate solely upon collodion. When it is remembered that a negative upon collodion can never be too vigorous, provided always, that a proper gradation of tone exists, for we must always take care to avoid harsh and crude contrasts. This latter condition fulfilled, the best negative will always be that, which, allowing the light to pass through with difficulty, requires for the complete production of the positive proofs, a comparatively lengthy exposure. The image produced by such a negative will exhibit great harmony and gradation of tone: it will exhibit the minutest details in the half tones and shadows without hardness, and, in a word, realize all the conditions which, by assuring success, will decide the reputation of a photographic artist.

The collodion process is almost exclusively reserved for the production of portraits, and it will not be a work of supererogation, to indicate the conditions indispensable for success in this attractive branch of the art.

The artistic value of photographic portraits.—If photographic portraits have their enthusiastic admirers, they have also obstinate detractors. These latter. among which it must be admitted many artists were for a long time included, persisted in regarding a photograph as the product of mechanical intelligence, the measured and cold regularity of whose operations compelled a result which might be anticipated beforehand. They classed the camera with the barrel organ which spins out melody by the turning of a crank. If the practice of photography were confided only to a certain class of mechanical operators, it would, doubtless, merit all the reproaches cast upon it; but, fortunately, the labours of others possessing a true feeling for art, combined with a high degree of manipulatory skill, have brought photography to occupy a high position among the fine arts. Portraits are daily produced, which may vie in every artistic feature with the finest productions of engravers; and if we reflect that every photographer, if endowed with true artistic taste and feeling, can impress a stamp of originality on his works, which utterly precludes the possibility of their being mistaken for the works of another, we shall be compelled to admit that, if photography be a manufacture, it is also an art. Doubtless, *chefs d'œuvre* are the exception rather than the rule, but the public does not, as a general rule, demand works of the highest class; and while content with much that must be ranked as mediocre, it gives an impulse and support to a profitable industry. But even productions of this class take a much higher rank in the scale of art than the crude attempts at miniature painting which they have superseded. Public taste is evidently improving, and by the time that photography is capable of supplying the demand for works of the highest class, we may expect public taste to have made such progress as to tolerate no longer works of inferior merit.

(*To be continued.*)

British Association for the Advancement of Science.

PHOTOGRAPHIC SPECTRA OF THE ELECTRIC LIGHT.

BY PROFESSOR MILLER.*

A LECTURE on the subject of spectrum analysis generally was delivered in the Free Trade Hall on Friday evening, but as it consisted chiefly of a historical recapitulation of the facts with which our readers been have from time to time made familiar, it is unnecessary to give any details of the lecture here. The details on the spectra of various electric lights will be interesting:—

"The apparatus by which the spectra may be photographed consists of an ordinary camera-obscura attached to the end of a long wooden tube, which opens into a cylindrical box, within which is a prism glass, or a hollow prism filled with bisulphide of carbon. If the prism be so adjusted as to throw the solar rays, reflected from a heliostat upon the screen of the camera, and the wires which transmit the sparks from Ruhmkoffer coil, are placed in front of the uncovered portion of the slit, the two spectra are simultaneously impressed. The solar beam is easily intercepted at the proper time by means of a small screen, and the electric-spectrum is allowed to continue its action for two or three, or six minutes, as may be necessary. He did not find that anything was gained in distinctness by interposing a lens of short focus between the slit and the wire which supplied the sparks, with the view of rendering the rays of the electric light parallel like those of the sun, owing to the absorbent action of the glass weakening the photographic effect; and the flickering motion of the sparks being magnified by the lens, rendered the lines less distinct than when the lens was not used. Although with each of the metals (including platinum, gold, silver, copper, zinc, alumnium, magnesium, iron), when the spark was taken in air, he obtained decided photographs, it appeared that in each case the impressed spectrum was very nearly the same, proving that few of the lines produced were those which were characteristic of the metal. The peculiar lines of the metal seemed chiefly to be confined to the visible portion of the spectrum, and these had little or no photographic power. This was singularly exemplified by repeating the experiment upon the same metal in air, and in a continuous current of pure hydrogen. Iron, for example, gave, in hydrogen, a spectrum in which a bright orange and a strong green band were visible, besides a few faint lines in the blue part of the spectrum. Although the light produced by the action of the coil was allowed to fall for ten minutes upon a sensitive collodion surface, scarcely a trace of any action was procured; whilst, in five minutes, in the air, a powerful impression of numerous bands was obtained.

"It was remarked by Mr. Talbot that, in the spectra of coloured flames, the nature of the acid did not influence the position of the bright lines of the spectrum, which he found was dependent upon the metal employed, and this remark had been confirmed by all subsequent observers. But the case was very different in the absorption bands produced by the vapours of coloured bodies,—there the nature of both constituents of the compound was essentially connected with the production of absorptive bands. Chlorine, combined with hydrogen, gave no bands by absorption in any moderate thickness. Chlorous acid and peroxide of chlorine both produced the same set of bands, while hypochlorous acid, although a strongly coloured vapour and containing the same elements, oxygen and chlorine, produced no absorption bands. Again, the brownish red vapour of perchloride of iron produced no absorptive bands; but when converted into vapour in a flame, this gave out bands independent of the form in which it occurred combined.

"These anomalies appeared to admit of an easy explanation of the supposition that, in any case, the compound is decomposed in flame, either simply by the high temperature, just as water is, as shown by Grene, or, in all other cases of the production of bright lines by the introduction of a metallic salt into a flame of burning bodies (as shown by Deville). In the voltaic pile the decomposition must of necessity take place by electric action. The compound gases, protoxide and binexide of nitrogen, gave, when electrified, the same series of bright bands (as Plücker had shown), which their constituents when combined furnish. Aqueous vapour always gives the bright lines due to hydrogen and hydrochloric acid, the mixed system of lines, which could be produced by hydrogen and chlorine, The reducing influence of the hydrogen and other combustible constituents of the burning body would decompose the salt, liberating the metal, which would immediately become exidised or carried off in the ascending current.

"There was obviously a marked difference between the effect of intense ignition upon most of the metallic and the non-metallic bodies. The observation of Plücker upon the spectra of iodine, bromine, and chlorine, shows that they give, when ignited, a very different series of bands to those which they furnished by absorption, as Dr. Gladstone had already pointed out; but it was interesting to remark that in the case of hydrogen, which, chemically, was so similar to metal, we have a comparatively simple spectrum, in which the three principal bright lines correspond to Fraunhofer's dark lines, C. F. and G. It was, however, to be specially noted that the hydrogen occasioned no perceptible absorption bands at ordinary temperatures in such thickness as we could command in our experiments, and the vapour of boiling mercury was also destitute of any absorptive action, although when ignited by the electric spark, it gave a characteristic and brilliant series of dark bands.

"The following experiment suggested itself as a direct test of Kirchoff's theory. Two gas-burners, into which were introduced chloride of sodium on the wick of the spirit lamp, were placed so as to illuminate equally the opposite sides of a sheet of paper partially greased, The rays of the electric light screened from the photometric surface, suitably protected, were made to traverse one of the flames. If the yellow rays of the light were absorbed by the sodium flame, the light emitted laterally by the flame should be sensibly increased. The experiment, however, failed to indicate any such increase in the brilliancy of the flame, possibly because the eye was not sufficiently sensitive to detect the slight difference which was to be expected."

ON LIGHTNING FIGURES.

Mr. Tomlinson, of King's College, read a paper on this subject, chiefly with reference to those tree-like or ramified figures sometimes found on the bodies of men and animals that have been struck by lightning. Professor Pocy has collected a number of such cases into a memoir, entitled "The Photographic Effects of Lightning," a second edition of which has been published at Paris during the present year. One of these cases is the following:—A boy climbed a tree to steal a bird's-nest; the tree was struck by lightning, and the boy thrown to the ground; on his breast the image of the tree, with the bird and nest on one of its branches appeared very plain. Mr. Tomlinson explains such cases by referring to breath-figures, and showed that when the discharge of a Leyden jar is received on a pane of glass, it burns away a portion of the organic film which covers all matter exposed to the air, so that when breathed upon, the

* Read on Friday, September 6th, in Section B.

moisture condenses in unbroken streams along the lines where the electricity has passed; while on the other parts of the surface the moisture condenses in minute globules, so that on holding the glass up to the light the figure is distinctly seen, so long as the breath remains on the plate. This figure resembles a tree, bare of leaves, and might (as the President of the Section afterwards remarked with reference to the diagrams exhibited), be taken for any tree in the world. In this figure we have a broad and somewhat rippled line of least resistance or path of the principal discharge, branching off from which are numerous ramifications, from each of which proceed large twigs, and from these smaller ones of great delicacy and beauty. It can be proved that when the discharge of a Leyden jar is thus received on glass, the jar sends out feelers in all directions to prepare the way for the line of least resistance, and this being accurately marked out, the principal discharge takes place. In some cases the discharge bifurcates, and even trifurcates. If the glass presents too much resistance, the breath-figure consists of three feelers only, and these are the lines which produce the sensation of cobwebs being drawn over the face, which seamen sometimes describe as the forerunners of the ship being struck. The main trunk is hollow, and resembles in its structure the silicious tubes known as fulgurites. Mr. Tomlinson took this figure to be typical of the lightning discharge which strikes terrestrial objects, and objected to the stereotyped zigzag by which a stroke of lightning is generally represented. His theory is, that when a tree-like impression is found on the body of a man or animal struck by lightning, a portion of the fiery hand of the lightning itself has passed over the victim and left its mark. Several cases of this kind were described and discussed, but allowance must be made for the imagination of by-standers, which leads them to see in these ramified impressions "an exact portrait of the tree;" the blotches are taken for leaves, for a bird or bird's-nest, &c., as the case may be. Cases were also examined in which these tree-like impressions were referred by medical men to ecchymosis; other cases in which the impressions of a horse shoe, of a nail, of a metal comb, of coins, &c., were found on the persons of the victims, were explained on the principle of the transfer of metallic particles from one conductor to another, as illustrated by the well known experiment of M. Fusinieri. Mr. Tomlinson rejected the photo-electric theory, by which M. Poey attempted to account for the production of all these figures; and in the discussion which afterwards took place, the Astronomer Royal, Professor Hennessy, and others, were disposed to agree to Mr. Tomlinson's view of the subject.

Dictionary of Photography.*

Reticulation, in collodion, consists in the presence of the dried film of innumerable small cracks or fissures, crossing each other and forming a net-work. It is distinct from what is known as "craping," which consists more properly in the formation of corrugated lines in the direction in which the collodion flowed off the plate; although reticulation not unfrequently follows the drying of the film which had in the first instance only shown a craping tendency. A tendency to reticulation may be produced by a variety of causes, but it rarely is absolutely caused save by the presence of too much water in the solvents. The condition of the pyroxyline may be favourable for its production in two ways. A pyroxyline made at a very low temperature, giving a coarse gelatinous collodion, and flowing with a decidedly crapy structure, will sometimes when dry give a reticulated film, even where the same solvents with a better pyroxyline would have caused no such result. But the same pyroxyline with more anhydrous solvents, especially with a preponderance of ether would not have produced reticulation. A very rotten and powdery pyroxyline, especially if its condition be caused by the action of an alkali, frequently causes a tendency to reticulation, its operation in regard to solvents being similar to that just described. It is important to remark that any kind of collodion has its tendency to reticulation much increased by immersion in the silver bath before it is sufficiently set. This really adds a given quantity of water to the collodion; for, instead of the pores of the collodion closing as the ether and alcohol evaporate, which they do whilst it is kept out of the bath, the ether and alcohol in the bath are simply expelled from the film to give place to a given quantity of water. Another cause which materially tends to cause reticulation is long-continued development. By the operation of long-continued development in an under-exposed picture there is generally an increased surface deposit of silver, which causes unequal contraction and consequent reticulation in drying. If the film have any pre-disposition to this reticulation it is frequently produced by any process of intensification after fixing, especially by the use of bichloride of mercury, and more especially still if hydrochloric acid be used in making the solution. It should be observed, then, that where a collodion shows the tendency to produce a reticulated film, it should be allowed to set thoroughly before immersion in the nitrate bath, and should not be used for processes, involving the accumulation of surface deposit by after intensifying; where these latter methods of strengthening negatives are used, a suitable collodion free from reticulating tendencies should also be used. There is no certain method of improving a collodion possessing these tendencies. The only plan is to adopt the precautions in its use we have indicated, or to mix it with another sample of collodion free from such tendency. The addition of about ten minims of chloroform to each ounce of collodion has been recommended as a cure, but is of uncertain efficacy and only applicable at all in certain cases. It is needless to say that reticulation is fatal to the value of a good negative, and every precaution should be used to prevent its occurrence.

Retouching.—The term retouching is used, in photography, to denote that kind of alteration, or improvement, which a print receives from the pencil of the artist when his pigments are of the same tint as the photograph. The mere "touching out" of slight spots scarcely comes under the term "retouching," which is more generally understood to mean the addition of something wanting in the photograph, either of vigour or detail. At one time, in professional photographic portraiture, retouched prints on plain paper were very common; but as the art has advanced, the production of perfect prints has become more general and retouching has fallen largely into disuse. Where it is necessary to resort to such a method of removing defects, or adding improvements, the tint of the photograph should be carefully imitated by means of sepia, madder brown, Payne's gray, Indian ink, burnt carmine, &c., mixed in proper proportions, and if the print be on albumenized paper, a little gum should be added. The colour should be applied with a somewhat dry pencil, and a little at a time. Where the difference in surface caused is very apparent, the subsequent application of an enamel or encaustic paste, is a great improvement.

Rotten Stone.—A soft stone, chiefly found in Derbyshire, which when reduced to powder, and sifted, is valuable as a polishing agent, and is useful to the photographer in cleaning glass plates.

Rouge, otherwise Colcothar, or red oxide of iron.—A red metallic powder, very useful for various polishing purposes. It is used for giving the final polish in grinding lenses. It should be avoided in cleaning glass plates for photographic purposes, as it is apt to be lodged in the imperceptible interstices of the surface, and cause spots.

Sal-Ammoniac.—The commercial name of chloride of ammonium, which see.

Salt.—A salt always consists of two parts, which parts

* Continued from p. 417.

may themselves be either simple or compound. In one case the chloride of sodium may be taken as a sample, which consists of chlorine and sodium. The second class of salts consists of an acid and a base, of which nitrate of silver is a familiar example, each of the parts being in this case compound; one part consisting of nitrogen and oxygen, and the other part of oxygen and silver, or oxide of silver. By the term salt, is meant, in popular phraseology, chloride of sodium.

Saltpetre.—See nitrate of potash.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 2nd October, 1861.

Some recently executed instantaneous stereographs of this metropolis, produced by one of your London stereoscopic companies, have been exciting some attention here. They are very fine, and perfectly instantaneous, walking and running figures being impressed on the collodion plate, with foot uplifted, never, in the picture, to be put down. It is somewhat singular that until recently instantaneous photography has not been much practised here. Until Messrs. Ferrier's recent street scenes, instantaneous pictures of Paris were comparatively unknown. It is somewhat siugular in a capital where photographic enterprize, generally, is more active perhaps than in any other part of the world, the initiative in populariziug instautaneous views of its streets should be taken by a foreign firm. I say popularizing, because M. M. Ferrier's pictures being transparencies on glass, cannot circulate amongst the people at large, as can these on paper to which I have referred.

One of the partners in the firm of M. M. Ferrier & Co. has been, I understand, travelling in the northern conntries of Enrope, which have hitherto been comparatively untouched by photographers, and some highly interesting pictures, I believe, may shortly be expected.

M. Augendre has invented a white gunpowder, which is composed of

28 parts of prussiate of potash.
28 parts of sugar.
23 parts of chlorate of potash.

The temperature produced by the deflagration of this compound is only 1,900° C. against 2,993° C. produced by ordinary gunpowder, and yet with a weight which gives only 23,000 cubic centimetres of gas with the old gunpowder, we obtain 43,000 cubic centimetres with the white. Besides, the new powder leaves less solid residuum, only 0·77 of the quantity left by the old powder. But with all this superiority we can hardly expect it to supersede the ordinary gunpowder. Messrs. Bunsen and Schischkoff have endeavoured, in an able report to establish the "*chemical theory of gunpowder.*" They consider that the different elemeuts depend, for a given quantity of gunpowder, on the composition of the residuum, on the quantity of this residue, on the temperature produced by the combustion, on the pressure of the gases generated, and on the theoretical work the gunpowder can perform. They have examined all these elemeuts by the most careful analysis and calculations, the results of which are detailed in their report: they have discovered that the decomposition of gunpowder rests upon facts entirely different from those which serve as the basis of the old theory; they fiud that the temperature of the flame of gunpowder burnt in the air is 2,993° C., and in a close space it is 3,340° C. The tension of the gas in the explosion under the projectile never attains 4,500 atmospheres, much less 50,000 to 100,000, as assumed by Piobert.

M. Melsen shows that a powder theoretically good may be, practically, bad; the imponderable fluids, chiefly heat, contact, pressure, quantity, the nascent state, division, volatility, &c., are so many circumstances capable of modifying reactions, and of reacting upon the dynamic effects of powders of the same chemical composition. Messrs. Bunsen and Schischkoff experimented only with a single sample of gunpowder, and it is probable that if they had employed different varieties in their experiments, they would have found occasion to modify their conclusions. The temperature of the flame of gunpowder is variously stated in numbers varying from 2,993° C, to 4,603° C, in the hands of different experimenters. The question of the theory of gunpowder, it must be admitted, is a very complex one.

Some time ago a cupro-ammonical liquid obtained by the contact of copper with ammonia is presence of atmospheric oxygen was proposed a solvent for gun cotton. M. Peligot has published an iuteresting memoir upon the products which accompany the formation of this liquid, specially treating upon a new colouring material, hydrate of copper, which can replace the pigment known as Sauuders' blue, in its applications to painting, calico-printing, and paper-staining. The process which succeeds best in obtaining a large quantity of the cnpro-ammoniacal solution consists in introducing into large glass vessels of the capacity of 10 to 12 quarts, 15 to 20 grammes of copper, and 60 cubic centimetres of concentrated ammonia. The metal, which comes from the reduction of a salt of copper by iron or zinc is passed over the sides of the glass vessel, so as to adhere under the form of a thin layer. In the course of a few minutes the vessel becomes warm, and filled with thick white fumes which are nitrite of ammonia. When the action appears terminated, the atmosphere of the vessel is changed by means of bellows, and the operation repeated several times. Indepeudently of the blue solution thus obtained, there remains a product insoluble in water and in ammonia of a non-uniform colour, yellow, brown, or olive-green, which is a mixture of the two oxides of copper and of the unattacked metal. By substitutiug ammonia saturated with sal ammoniac for the simple liquor ammonia the reaction is much more vivid: in a few moments all the copper is attacked and completely dissolved. Evaporate to dryness in a porcelain capsule, on a *bain marie*, the blue liquor produced by the simultaneous action of the air and the ammonia upon the copper without the addition of the sal ammoniac: pulverise the residne, and submit it to the action of ammoniacal alcohol (alcohol previonsly saturated with ammoniacal gas); it is then filtered, and upon cooling, needle-like prisms of a beautiful violet colour are deposited, the composition of which is NO^3, Cu O, NH^4 O, HO, and which, heated to 212° Fah. are slowly converted into anhydrous nitrite of copper NO^3, Cu O. In contact with a small quantity of water this nitrite dissolves with great reduction of temperature, a portion of the ammonia becomes free and is disengaged; when this solution is left to spontaneous evaporation, hydrated nitrite of ammonia is obtained and a green crystallized salt, NO^3, 3CuO, NH^4 O. When a large quantity of water is poured into the blue solution furnished directly by the copper, ammonia, and air, or upon the two salts derived from this solution, a precipitate of a beautiful torquoise blne is obtained; this is hydrate of copper. CuO, HO; by calcination it gives 80 to 81·5 per cent. of oxide of copper; the formula requires 81·6. It resists the action of boiling water; it may be heated in a stove to 212° F. without undergoing any alteration; it slowly absorbs carbonic acid from the air without changing colour. It may be prepared economically on a large scale, either by treating a salt of copper dissolved in a large quantity of water with an alkali in excess, to which a slight excess of ammonia is previously added; or by pntting some potassa or soda into a solution of salt of copper, previously mixed with sal ammoniac; or still more simply by adding a great excess of water to a weak ammoniacal solution of nitrate of copper. Concentrated *liquid ammonia* dissolves 7 to 8 per cent. of this hydrate; this solution is certainly the best solvent of cellnlose, and of other substances soluble in M. Schweitzer's reagent. M. Chevreul, who has examined the chromatic power of this hydrate of copper, states that its colour is a pure blue, while that of Saunders' blue (carbonate of copper) is a violet blue.

TAXATION FOR PHOTOGRAPHY.

Dear Sir,—As a subscriber from the first number of the News to the last, I beg the privilege of addressing a few words to my brother readers and the public through the medium of its pages. Having seen so often how willingly you accord space for the purpose of advancing the interests of the art, I beg to submit the following suggestion, having for its object the protection of the photographer, both amateur and professional.

You have often reported instances of the latter suffering to a serious extent, both in reputation and pocket, by the piratical copying of their works, for which, at present, there exists no remedy, nor does it appear we are likely to obtain any, unless as a body we secure it for ourselves. I therefore suggest the following remedy, and think that able financier, the Chancellor of the Exchequer, ought not to overlook its merits in a pecuniary point of view, viz., a penny patent. I trust I shall not be charged with egotism in saying, I believe the idea, which is quite original, to be none the less practical. But how is this to be done? I propose in the following manner:—Let there be a penny adhesive stamp, prepared and sold by all the stamp distributors, or obtainable by post-office order from the chief office, the affixing of which on any photograph shall render it a felony to copy and offer for sale or otherwise dispose of. It is obvious that every one would, for safety sake, be sure to stamp every copy offered for sale, as an unstamped one might be copied without infringing the patent right.

As a further security, every one using these stamps should be compelled, in order to prevent fraud, to write across or deface them by stamping his name thus—

Nightingale's }
Registered. }

The writing or stamping of any copy, without the affixing of the patent stamp, to be fineable, not exceeding 40s. for each copy so represented to be registered or patented. It would not, therefore, be compulsory to stamp any one copy, unless it was represented to be registered or patented. This would be a far cheaper mode to the photographer in general, than copyright, as only so many penny stamps need be used as copies sold, and the more of those, as the saying is, the merrier.

I can fancy now that some will say, "Oh, that's very fine then, I suppose, because one fellow takes a view, good, bad, or indifferent, and puts a stamp on it, every one else is to be stopped from taking the same view." But such is not my wish. My object is to prevent another from reaping the benefit by pirating the results of, to a great many of us, hard and expensively procured negatives, and I conceive the penny patent will effect this. There are ways and means to mark every negative without marring it, and a private mark to distinguish it can be put on the negative, which would be copied into every print, to copy which is to constitute the felony.

I mark a good many of my view negatives with the portrait of a tractable dog, to a copy of any of these views I could, therefore, positively swear, from the position and photograph of the dog; and so on in a great variety of ways might every original picture be marked. Portraits could have the name of the photographer in the darkest part of the background, in such a place that it must form part of the mounted proof, but these negatives are mostly well-marked by the furniture, &c., and need no farther proof of identity.

I think the penny patent could also be made available in a variety of purposes in the arts and manufactures. The present system of patenting is expensive, troublesome, and often very unsatisfactory. Why not have a stamp according to value put on each article patented, to copy which, or make one like it would be, as at present, an infringement. This, however, mine and wiser heads may possibly develop; but we have ample proof that liberal terms induce support and encourage trade in the success attending the penny postal regulations, and, therefore, I think there should be a penny patent for photographers, who would be only too happy to avail themselves of its advantages.

A few words with regard to licensing photography, and I will not trespass farther on your valuable space. Mr. Swatridge recommends that photographers should be licensed, as a means of putting down some of the dens. I fear it would be only biting off our noses to spite our faces, besides doing a great deal to stop the advance of the science in the hands of amateurs, a class to whom the history of photography shows we are largely indebted. There is, however, a class of photographers who ought to contribute something to the state; but who, by the very class of their custom, do less in proportion than the established professional, who is obliged to pay rent, rates, and taxes. I mean the travelling photographer, who uses only the cheapest materials, collodion, &c., made from methylated spirit, which does not even in an indirect manner contribute to the state in the shape of duty on the spirit; neither does he use goods of foreign manufacture (must we except the miserable cheap lens) which are extensively patronised by the better class of photographers, and which pay customs duty. Rates and taxes also they pay none, and as I have witnessed lodgings are in the list sometimes. It is, therefore, only fair that they should in some way contribute towards the support of the state, as well as the established photographer, to whom they do a serious injury. The tradesman is protected by the hawker's license. The poor man who sells salt and collects old rags, bones, and metals in exchange, has to pay a license; but the returned convict who advertises "potografix on the same terms of exchange" *(fact)* pays none, yet he hawks passepartouts, cases, &c., which are not his own manufacture, as much as the other hawks salt. I think it is, therefore, only right for such photographers to pay a license of £3 a year, and if travelling with a van, £6 per van.

There would then be less frequency of the visits in the provinces of M. de Flitter from the Royal Polytechnic, or Madamoiselle Golmen, with her wonderful Photographic Museum, under the management of Herr Jeau de Puff, to cut up the trade and destroy the public confidence in photography.

I have made these suggestions, trusting they will elicit from yourself or some of your subscribers a better idea, something more practical, but at least a mode of redress for the piracy from which so many (myself among the number), suffer.—Enclosing my card, I am, dear sir, yours respectfully,

W. B. N.

SUNDAY PHOTOGRAPHY.

Dear Sir,—Will you kindly allow me to make an observation or two, in reply to your correspondent E. E. L., whose letter appeared in a recent number of the News. If it were not for the importance of the subject, and the necessity I feel that something should be done in reference to these dens, I would not have troubled you on this subject again. I agree with my friend E. E. L., when he says that the public have the matter in their hands; but unfortunately for us, as he justly remarks, the general public *are not learned in art, and are imposed upon too often at a price which a conscientious man would be glad to supply them with a genuine art photograph;* this is the rub, the public as a whole do not appreciate good photographs; but the general *cry is cheapness* and *not quality*, so we cannot, I think, expect the public to help us much in this way. I repeat that it is my opinion that a tax, if properly and judiciously carried out, would remedy the evil of which we all complain. I merely throw out this idea, leaving it to others to fill up minor details, &c., or make any alteration. I should be very sorry to see a tax, imposed in such a way that it would have the effect which your correspondent fears, of deterring any really clever and respectable man from entering the profession on account of their inability to pay for a licence. I would not propose that these licences be granted indiscriminately to any one who applies for them. It matters not if we consent to be taxed to the amount of £1, £10, £20, or £30 per annum, or what not; if the tax be ever so slight, and licences be granted to those only who possess the scientific knowledge, artistic taste, &c., requisite for the production of artistic photographs, we shall at once rid the country of these vile dens which are a disgrace both to the art and the profession, and no respectable and clever photographer would object to such a course being taken.—I remain, dear sir, yours very truly,

F. S. Swatridge.

Princes Street, Yeovil, Sept. 14, 1861.

IS PHOTOGRAPHY A FINE ART?

Sir,—I do not wish to trespass again upon your space, at any length, on this subject; but will, by your permission, just make one or two remarks in answer to those who have combatted my arguments. I am fully sensible of the courtesy and intelligence which have characterised the remarks both of yourself, and of your various correspondents, in replying to my letter, and would beg to show my appreciation of these qualities, by assuring your readers that I feel neither the jealousy of, nor contempt for, their art, that some photographers are in the habit of attributing to artists. I entertain a hearty admiration of photography, and a desire to see it estimated at its true worth.

It would be a bootless task to enter at large into all the questions raised by your correspondents; but I may remark that they all, "first-class portraitist, artist, amateur, and operator," in greater or less degree raise an issue different to that with which I dealt. I treated the subject *in esse*, they dealt with it *in posse.*

They speak of the *capabilities* of the art, I referred more especially to its hitherto achieved results. M. Claudet, in his admirable letter, refers to a period in the world's history when painting and sculpture were not regarded as fine arts. His statement is perfectly true, *neither were they at that time fine arts.* They had at that time, as you have phrased it, yet to win their spurs. Possibly photography may achieve her position in the "circle of the fine arts," ere she has seen as many years as painting and sculpture saw cycles before they were recognized; but she must *win* her position. When photographers generally have become artists, then the power they wield may be recognised as a fine art. I grant that all who cover paper or canvas with pigments are not artists; but is it necessary to affirm that the family is so large, and the ancestry so illustrious, of painters who *are* artists, that painting has established its indisputable right to a first place amongst the fine arts? Can the same be alleged of photography? Have its professors as yet established their claim indisputably? That the time will come when they may do so I will not deny. Who shall look at the infant art and limit its future? It has already proved itself an important adjunct of art. I believe it has already tended in some measure to infuse truth into painting, in place of a vicious conventionalism. But as yet it has not, by its independent productions, proved its claim to the position of a distinct fine art. I repeat it: the struggles after process, the discussions about methods, prove that something is still wanting in result.

I do not object to photographers making ambitious effort; but let them beware, as yet, of making too high claims. The universal decision of society will ultimately be just; and if photography occupy a place too lowly, it will assuredly hear the verdict, "come up higher." Let photographers then, if they can, make photography a fine art: as yet I fear they have failed, in the main, to do so.—Your obedient servant,

R. A.

Hints to Operators.

To use Buckle's Brush.—This brush which, as our readers know, consists of a tuft of clean cotton wool drawn just within a glass tube, is used for spreading solutions on plain paper. A correspondent, "D. L. J," writes to mention a method he has found very successful when using this brush. He says, "I partially fill the tube with the solution, and find it keeps the wool saturated, and consequently obviates the necessity of dipping the brush again and again."

To Graduate a Back-Ground or Sky.—During the process of strengthening or intensifying a negative, no matter what method we use, it is possible by manipulation to secure a denser deposit in parts so as to obtain gradation of tint. If it be a portrait back-ground, and a little extra light is desired behind the head, keep constantly pouring on the solution—say pyro and silver—at the part. This will be found to cause an increased deposit there, gradually softening into the surrounding parts. If the picture be a landscape, and the increased light is required in the horizon, the solution must be poured on in the same manner, but spread right along the horizon line. Care must be taken in such case to avoid burying the distance, where it is present, by over development.

Hints on Washing Prints.—Repeated changes of water are much more valuable than long soaking. In changing the water take care to drain well every drop of the water last used, and rinse before adding fresh water. A thorough draining of each print, separately, two or three times, or a separate washing with a sponge, is worth hours of soaking. Many hours soaking in the same water, especially if the prints have not been well washed previously, often seriously impoverishes prints, as they are, in that case, only remaining in a weak solution of hypo.

Photographic Fallacies.—It is an error to attribute chalkiness to overexposure; it is always the result of over-development or over-intensifying. It is an error to imagine that anything will do for a printing bath, and therefore to evaporate and use up old collodion baths. As good prints are the final aim of all efforts, the utmost care should be used to keep everything connected with printing in good order. It is an error to think that a "converted positive" will even by any process make a good negative. No matter what process be used, longer exposure is always necessary to produce a good negative, than is necessary for a good positive. It is an error to suppose a positive collodion is necessary to produce negatives by iron development. A bromo-iodized negative collodion is necessary to produce good results, and the use of an ordinary positive collodion often results in weak, grey, flat pictures. It is an error to think that spots, stains, streaks, &c. &c. are accidents, they are more generally the results of careless manipulation.

Album Portraits.—To succeed in taking these portraits, with standing figures, satisfactorily, it is important that lenses of long focus be used. Where the length of the glass-room does not admit of this, it is then desirable to have lenses made expressly for the purpose, in which the aim of the optician has been to produce a flat field. Where ordinary quarter-plate lenses are used, standing figures should be, as much as possible, avoided; the sitting figure corresponding better with the curve of the field. When the figure is standing, the camera should not be too high, and should never be tilted, otherwise the figure will appear to stand upon an inclined plain. Incongruous accessories should be avoided—such as a balustrade standing upon a carpet, or a painted back-ground with the objects lighted from the opposite direction to that in which the light falls on the figure. In mounting, the effect is best where about the eighth of an inch of white margin is left all round except at the bottom, which should have half an inch. All spots should be touched out before the picture is rolled. Rolling is almost indispensable to card portraits.

INTERNATIONAL EXHIBITION OF 1862.

Her Majesty's Commissioners have issued the following decisions:—

Medals.

"Prizes or rewards of merit, in the form of medals, will be given in Sections I., II., III."

(*a*.) These medals will be of one class, for merit, without any distinction of degree.
(*b*.) No exhibitor will receive more than one medal in any class or sub-class.
(*c*.) An International Jury will be formed for each class, and sub-class, of the Exhibition, by whom the medals will be adjudged.
(*d*.) Each Foreign Commission will be at liberty to nominate one member of the jury for each class, and sub-class, in which staple industries of their country, and its dependencies, are represented.
(*e*.) The names of the Foreign juror must be sent to Her Majesty's Commissioners before the 28th of February, 1862.
(*f*.) The British jurors will be chosen in the following manner:—
Every exhibitor will name three persons to act on the jury for each

class, or sub-class, in which he exhibits, and, from the persons so named, Her Majesty's Commissioners will select three members of the jury for each such class or sub-class.

(*g*) Her Majesty's Commissioners reserve to themselves the power of modifying these arrangements, in any particular case where it may appear to them that the strict application of the principles of these decisions would be attended with injustice.

(*h*.) The names of the jurors will be published in March, 1862.

(*i*.) The juries will be required to submit their awards, with a brief statement of the grounds of each, to Her Majesty's Commissioners, before the last day of May, 1862.

(*j*.) Should the reasons assigned for any award appear insufficient, or should no reason be given, Her Majesty's Commissioners reserve to themselves the right of confirming or rejecting it.

(*k*.) The awards will be published in the Exhibition Building, at a public ceremony, early in the month of June, 1862.

(*l*) They will immediately afterwards be conspicuously attached to the counters of the successful exhibitors, and the grounds of each award will be very briefly stated.

(*m*.) If an exhibitor accepts the office of juror, no medal can be awarded in the class, or sub-class, to which he is appointed, either to himself individually or to the firm in which he may be a partner.

(*n*.) The medals will be delivered to the exhibitors on the last day of the Exhibition.

Processes of Manufacture.

Besides making arrangements for showing machinery in motion, and illustrating it by processes, Her Majesty's Commissioners will reserve space for the exhibition of processes of manufacture, in certain handicrafts which can be carried on without danger in the building. They consider that it will be interesting to the general public to have an opportunity of seeing the following and similar processes, and will reserve sufficient space for showing one illustration of each of them :—

Steel pen making.
Pin making.
Needle making.
Button making.
Medal striking.
Gold chain making.
Engine turning for watches, &c.
Type casting.
Type printing by hand.
Lithographic printing.
Copperplate printing.
Earthenware printing.
Porcelain printing.
A potter's wheel.
Brick and drain tile making.
Glass blowing on a small scale.
Turning in metal, wood, and ivory.
Glove-making, &c.
Pillow lace making of various kinds.

Applications to exhibit these processes, with full particulars of the space required, and of any special preparation which may be necessary, should be addressed before the 1st of November, 1861, to F. R. Sandford, Esq., 454, West Strand, W.C.

Photographic Notes and Queries.

Stereo Exchange Club.

Dear Sir,—In one of your late numbers of the News, you invite the opinion of those of your readers who have had some experience in the Stereoscopic Exchange Club as at present organised, with a view to commencing it afresh under a new set of rules.

I am a member of the club, and have exchanged between one hundred and fifty and two hundred pictures, ranging in quality from very good to disgracefully bad. As a change in the rules is necessary, I do not think a better plan can be adopted than the following, a part of which was recently suggested by a correspondent, namely, that a competent umpire, yourself, for example, be selected, to whom each member must send one print from every negative he proposes for exchange, each print to be accompanied by the name of view, process, and other particulars, &c. That a list of such pictures as are considered by the umpire good enough for exchange be published in your journal with the owners' names attached. That the prints be classified under three or more heads, say A for the best, B second quality, and C third quality; none but those in the printed lists to be acknowledged by the members.

Under this arrangement such members as possess pictures A. B, or C can exchange direct with fellow-members having others of the same quality, and can at the same time express their preference for any particular subjects according to the published lists. Any cause of dissatisfaction to be laid at once before the umpire, and the prints in dispute to accompany the complaint, that he may compare them with the originals.

Allow me also to impress upon you the importance of incorporating with this, an exchange club for larger pictures, say from $6\frac{1}{2}\times4\frac{3}{4}$ to 12×10. The same arrangements for classification, &c., could be carried out and published at the same time as the stereo prints.

I am sure that a well-regulated exchange club would be very advantageous to us amateurs in more ways than one.—Your obedient servant, I. H. J.

Ebonite for Photographic Vessels.

Dear Sir,—I fully agree with your correspondent, Mr. D. J. Fitzgerald, as to the value of *ebonite* for photographic purposes; and I hasten to supply the information you desire with regard to it. The principal, and best manufacturers in England are Messrs. S. W. Silver and Co., Bishopsgate-street. Their ebonite is distinguished from other and inferior productions by being a rich, deep black, and very hard and firm, though, at the same time, very flexible.

The more common kinds are of a dirty brown colour, comparatively soft, and of uneven texture.

Ebonite is not acted upon by any heat under about 350° Fah. It will, as you correspondent states, resist all but the *strongest* acids, such as nitric, fluoric, &c.—Your obedient servant,

Leo Daft.

2, *Queen-sq., Westminster, S.W.*, 1*st October*, 1861.

Miscellaneous.

India Rubber Varnish.—That india-rubber, dissolved in various liquids makes a good varnish, is well-known, but in general they are too viscid for general purposes, and are only good for making stuffs waterproof. India-rubber liquified by heat, dissolved in oil of coal-tar, or drying linseed oil, does not give a varnish of sufficient fluency, or free from smell; moreover, a considerable quantity of india-rubber remains undissolved in a gelatinous state, suspended in the liquid, so that the solution is never clear. Dr. Bolly has recently published some remarks on the subject, which may be useful. If india-rubber be cut into small pieces and digested in sulphuret of carbon, a jelly will be formed; this must be treated with benzine, by which means a transparent, but still yellowish liquid will be obtained. A more colourless solution may be prepared by digesting india-rubber cut into small pieces for many days in benzine, and frequently shaking the bottle which contains it. The jelly thus formed will partly dissolve, yielding a liquid which is thicker than benzine, and may be obtained very clear by filtration and rest. The residue may be separated by straining, and will form an excellent waterproof composition. As for the liquid itself it incorporates easily with all fixed or volatile oils. It dries very fast, and does not shine, unlesss mixed with resinous varnishes. It is extremely flexible, may be spread in very thin layers, and remians unaltered under the influence of light and air. It may be employed to varnish maps or prints, because it does not effect the whiteness of the paper, does not reflect light disagreeably as resinous varnishes do, and is not subject to crack or come off in scales. It may be used to fix black chalk, or pencil drawings; and unsized paper, when covered with this varnish may be written with ink.—*Galignani.*

Domesday Book.—The *Times* says:—"The publication of the part of the "Domosday Book" relating to Cornwall has now been before the public some time, and, as is stated in the introductory remarks to this volume, the prosecution of the publication, county by county, must depend more upon the wishes of the public than upon the Government. The publication of the part relating to Cornwall was permitted by the Government as an experiment to test the value of photozincography for producing fac-similes of our ancient records, and was entrusted to Colonel Sir Henry James, the Director of the Ordnance Survey, the original being of such inestimable value that it could not be allowed to pass into the hands of any private person, even supposing any private person was capable of copying it by this new art. The art of photozincography has, in the hands of the officers of the Ordnance Survey, been greatly improved since the publication of the pert of Domesday relating to Cornwall. And perfect as this copy appears to be, and in reality is, still, by slight modifications in the details of the process. The copies now produced have a sharpness and clearness in the outline not before attained.

Talk in the Studio.

Lectureship of Photography at King's College.—Mr. Sutton has resigned the office of lecturer on photography at King's College. An invincible repugnance to life in London, and an unconquerable longing for the wild solitude of St. Brelade's are, he informs us, the reasons for taking this step. Dr. Diamond, it is rumoured, will succeed him in the office.

British Association at Manchester.—It has been the subject of general remark amongst those interested in the proceedings of the British Association for the Advancement of Science, that on no former occasion has the reports in the local press been so copious or correct as on this occasion. It may gratify some of our readers to know that they may procure a very excellent and full account of all the proceedings, with the most interesting sectional papers in full, and others in abstract, in a pamphlet just published at the office of the *Manchester Guardian*, being a reprint of the reports from that paper.

Photography in the Exhibition.—The *Daily Telegraph*, in an article, a few days ago, on the Exhibition, had the following:—"We published last week an extraordinary decision of the authorities with regard to the exhibition of photographs—that decision, we are now told, has been rescinded. The statement we put forth, on good authority, was that photographic specimens, not coming properly within the limits of artistic description, would be classed with machinery. Our great operators were reasonably dissatisfied with this arrangement. Whatever the objection to their taking rank with the followers of pictorial art, it is certainly an anomalous proceeding to put them among machinists. The course taken has been a compromise. Photography is treated as it would have been in the old unscientific days, when a true classification was often inconvenient, if not impossible. It is placed, that is to say, in a corner apart, as a 'nondescript' object of exhibition." The "rescinding" referred to, simply means, we presume, the decision already known to our readers; namely, that photography will have a separate department.

Photographic Commercial Success.—It has been the custom of late of some people to speak of the palmy commercial days of photography as belonging to the past. From some recent statements which have come to our ears, there never was a period when such large incomes were realized by able and enterprizing professional photographers. One Parisian portraitist, we are assured, is at the present moment taking not less than £48,000 a-year. Whether any photographer in England is doing an equally large business we cannot say, but should be inclined to doubt. We have heard of one, however, in the metropolis, whose receipts are £12,000 a-year; and of another in the provinces whose business amounts to £10,000 a-year. If these be facts, the palmy days of photography are certainly not gone.

South London Photographic Society.—The members of this society are reminded that the first meeting, after the summer recess, will be held in St. Peter's School Room, on the evening of next Thursday, October 10th; when a paper on "The Photographer's Model" will be read by Mr. Wall.

To Correspondents.

A. B. C.—Prints should always be fixed before toning for several reasons; the most cogent of which, it is a very difficult and slow process to tone them after fixing. They should be toned in yellow light; but you may have plenty of it, and, if need be, you may give a hasty glance to judge of their progress by diffused day-light, without much risk, if you are careful. The bromo-iodized collodion you name is very good; it is better not quite freshly iodized. Use citric acid in your intensifying solution of pyro and silver; it will render the risk of fogging less. You may obtain a pretty good French quarter-plate lens for 30s.; but it will not cover standing figures in card portraits properly.

Positive.—There are several methods of converting positives into negatives; but unless the positive has been over-exposed it will not make a good negative. First, pour over the picture a solution consisting of iodine one grain, iodide of potassium one grain, water one ounce. In a few minutes wash well, and develop with the ordinary solution of pyrogallic acid, with a few drops of silver. 2. Card portraits are usually taken on quarter-plates, for which, of course, carriers are made. If your lens produce good pictures, 5 by 5, there is no reason why it should not produce good card portraits.

A Constant Reader.—The partial dissolving of your picture in varnishing arises from the varnish being made of too highly rectified alcohol. A "crystal" varnish, of which the solvent is benzole, not alcohol, will prevent the occurrence, and answer perfectly well for positives.

T. A. R.—A virulent case of "measles." Your prints are imperfectly fixed. The hypo is too weak, or has been too long in use, or the prints have been stuck together and imperfectly immersed. This has caused the formation of insoluble hyposulphite of silver, which on seeing the light decomposes, and produces the deplorable result your prints present. Use fresh hypo, of a strength of not less than one ounce of hypo in five of water; and see that the prints are well immersed and kept moving. The negatives we presume are instantaneous.

J. G. L.—We can only account for the non-arrival of several letters recently by attributing it to the growing dishonesty of post-office servants. Regarding the London Photographic Society we regret to say we cannot give you much help. Possibly the secretary was from home when you wrote. Regarding the journal, possibly you may get redress by writing to the publishers, Messrs. Taylor and Francis; that method we know is irregular, but it may possibly serve your purpose. The Sœhnée varnish is not spoilt for negatives by becoming coloured. We are not familiar with the second spirit varnish you name; but if it is not so hard as the Sœhnée, it is not so good for negatives. The third varnish mentioned is good, but not better than Sœhnée. The use of a very small central stop will, under some circumstances, cause a spot of light in the middle of the picture with any double combination of lenses. The remedy is to avoid the use of a stop too small; or, use a hood of some kind in front of the lens to shade off direct light not coming from the objects to be taken. This will generally answer. There are various arrangements for uncovering the lens for instantaneous exposures, and we cannot undertake to say which is best. Perhaps nothing surpasses the focussing cloth, or a hat or a cap. We have used all these successfully. The addition of acetic acid to a bath prepared with common water as recommended by Mr. Fry, would neutralize the results to be obtained. If you make another bath on the same principle, avoid the addition of acetic acid. If you adopt the plan recommended by Mr. Sellers, careful decanting may serve instead of filtering. Of the collodion named the two first are best. Regarding the new instrument of which you speak, probably mathematical instrument makers would be more likely to undertake it than opticians.

J. H. J.—We do not know the address of M. Bertsch; but probably a letter addressed to him at the French society would find him. The address of the society is No. 11, Rue Drouot, Paris. The address of Messrs. Bernstingl and Co. is Coleman Street, City.

J. Collins.—We should prefer the first of the names you mention; but you cannot ensure quick action, flat field, and defining powers "well up to the corners" in a cheap lens. It is to secure these qualities that the higher prices are paid to first-class English makers. We have used very respectable cheap French lenses, but we have rarely found them cover well the size for which they were sold. The best plan is to write to such a dealer as the first named, and ask him to *select* you one, even if you pay extra for the selection.

Braisheeth Avoia.—The reason your silver bath removes the albumen is that it is too weak, or that it is alkaline. Make your bath 70 grains to the ounce to begin with, and keep up the strength from time to time. If it very rapidly discolours add a few drops of nitric acid. When it gets very dark, agitate with kaolin and filter. There is no need at any time to throw it away. Always float albumenized paper; do not brush it. The fact that your paper darkened slowly under the action of light proves that the silver solution was nearly exhausted. To secure freedom from milkiness after using kaolin, always adopt the plan of letting it stand some hours after filtration, and then decant carefully, not to disturb the slight sediment which may remain. The various photographic papers are to be had of dealers in photographic materials. You will frequently find announcements in the advertisement pages of the Photographic News as regards price, &c. Common writing or printing papers are rarely good substitutes for photographic papers.

G. Smith.—Either the use of iodine followed by pyro and silver, or bichloride of mercury, followed by iodide of potassium, ought to answer for intensifying Fothergill negatives. In the latter case, use the solutions very weak. Thank you for the hints in your letter, which shall be used.

Caxton.—If you had accurately followed the instructions, you could not have failed to get a picture. State exactly what you have done, in detail, and we may be able to point out the source of error.

G. M.—The cause of the measly effect of the prints is undoubtedly imperfect fixation. If they be, as you state, the only two out of a large batch that are so affected, they have probably been amongst the last fixed in the same hypo, which was getting exhausted, and probably these prints were stuck together, or not properly submerged to allow the solution free access to them. See answer to T. A. R.

Sewad.—If a print be too pale there are no means of darkening it. 2. An iron developer for negatives may be made thus: protosulphate of iron 15 grains, glacial acetic acid 15 minims, water 1 ounce, alcohol *quantum suff.* 3. We cannot undertake to say which is the best varnish for positives.

Narberth.—The formulæ for the portrait lens of the various makers you name, have not been published, nor could we afford space for them here. To give any satisfactory answer to your questions, would require a treatise on optics. The rule for determining the proper distance between the lenses of a portrait combination, varies with the foci of the lenses. When their respective foci are as two or three the distance may be about one-third of the equivalent focus of the combination.

J. S.—The varnish referred to is advertised in our columns as sold by Mr. Rigge, of Bond-street. We do not know of a varnish for card portraits. Rolling is better than varnishing.

A. B. C.—A negative developed with iron may be further intensified with pyro and silver, or bichloride of mercury, followed by iodide or ammonia.

Tannin.—There is no method of removing the marks you describe but careful touching out. In developing, let your pyro run freely over the plate, and cover it well before adding any silver, and you will avoid such stains. You do not state the size of the lens to which you refer. We do not know much about the quality of that maker's lenses generally; but in his catalogue we find the 10 by 8 marked £5.

C. E. L.—We do not like the system of re-dipping plates into the nitrate bath before development. It is dangerous to the bath, and often causes fogging in the plate. If necessary, flooding the plate with a dilute and acid silver solution is better. M. Gaudin is an ingenious experimentalist, but not always a safe guide. His statements must be taken *cum grano salis*. A little more acid is generally the remedy for a bath which produces streaks. We have always found that answer. Using older and more coloured collodion or adding a little tincture of iodine, serves the same purpose. Oxide of silver is insoluble in water, but is held in mechanical suspension on shaking in a bottle of water. A few drops of this turbid solution is generally sufficient for a pint of nitrate bath.

"Phos" and "Z. Y."—Letters for both lie at our office.

An Amateur.—A whole plate lens will answer perfectly for card portraits if your room be long enough. The only difficulty will be in dull or thick weather, when the long distance between the sitter and the camera will interpose a great deal of partially opaque atmosphere, to dim the brilliancy of the image.

H. Newman and some other correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 162.—*October* 11, 1861.

SUNDAY PHOTOGRAPHY.

We have pleasure in being able to state that the agitation we recently initiated regarding this disgrace to the art and profession is likely to bear substantial fruit. An organization for the purpose of securing the entire suppresion of a practice which has grown into a public nuisance, is now on foot, and will, we hope, very soon be in successful operation. We hope to be able to announce full particulars very shortly.

We have received several letters on this subject, and others arising out of its consideration, which arrived too late for attention in the present number.

RAPID PHOTOGRAPHY.

We have recently had our attention called to the singular disparity between the ideas of rapid photography, and to the coincident practice, which exist in this country and in France. With a few unimportant exceptions instantaneous photographs were, until very recently, comparatively rare in France. The recent production, by Messrs. Ferrier and Soulier, of a series of instantaneous street views in Paris, was a circumstance so novel as to call forth an unwonted amount of excitement and attention, so that it was deemed necessary to account for the unprecedented sensitiveness by referring to some extraordinary condition of the silver bath, and a number of the photographic *gobemouches* were forthwith engaged in spoiling their baths by the addition of formic acid. Yet long before this an enterprising English firm had produced excellent instantaneous pictures of the same scenes. Not only so, for with the clear atmosphere and fine light of Paris this was, comparatively, speaking an easy task; but street views of London, of Edinburgh, and other of our smoky and fog-visited cities, as well as of river and sea views with moving shipping, were common in this country; several of our professional photographers having secured a reputation for instantaneous work, and many of our amateurs having worked successfully in the same direction.

We were, notwithstanding this, not a little surprised the other day in learning from a professional photographer, who had recently had an opportunity of visiting some of the Parisian ateliers, the long sittings usually given, and deemed necessary, in portraiture. In this country the time of sitting for card-portraits in summer weather, and with a good light, averages, so far as we have opportunity of ascertaining, from two to ten seconds, varying with the kind of lens and the lighting facilities possessed in different establishments. We have asked first-class operators, both in London and the provinces, and have been informed that four or five seconds was an average sitting, whilst, on occasion, for children, a much shorter exposure was given. Our own experience is confirmatory of the statements. In Paris, we are informed, thirty or thirty five seconds is the usual time of exposure on a bright summer day! One of the French operators, on being informed of the short exposure common in England, replied, with a shrug, that the pictures must be very hard.

We cannot pretend to account for this. The French portraits are certainly not hard; they are very fine, soft, and delicate: but we are unwilling to admit that they are better than the best English pictures, taken with much shorter exposure. Something is doubtless due to their lenses. The best French lenses are not, in our opinion, at all equal to those of the best English makers; and the fact that the lenses with which Messrs. Ferrier produced their instantaneous views were procured from one of our first English opticians bears out this opinion. We learn, moreover, that it is customary in Paris to take card portraits with lenses of very long focus. Instead of attempting, as some of our portraitists foolishly do, to take them with a quarter-plate lens, they use a lens of a focus somewhat longer than the usual half-plate portrait lens. But this is insufficient to account for the enormous disparity in the time of exposure.

Again, one of their authorities has recently insisted, with considerable emphasis, on the importance of using the collodion and nitrate bath acid, and the iron developing solution stale, in order to get clean negatives. If this be the usual practice, it will help to account somewhat for the fact in question. With some of their operators, we believe, it is the practice to permit a few minutes to elapse between coating the plate and immersing it in the bath, so as to allow it to be set firm all over before it comes into contact with the silver solution. This, as most experienced photographers are aware, tends to diminish the sensibility of the film.

Whatever the cause, or combination of causes, we are assured of the fact, that whilst working with bromo-iodized collodion and iron development, the same as the majority of English portraitists, they are in the habit of giving an exposure in the fine light of Paris three or four times as long as is customary in this country.

As associated somewhat with this question of rapidity, we may here make one or two remarks on an article in a French contemporary, who is outraged by the statement which appeared in our pages some months ago, to the effect that Mr. Breese, of Birmingham, had exhibited some stereographs, said to be produced by the light of the moon. Our article reviewing these pictures was translated into the *Bulletin* of the French Society, and M. Mc A. Gaudin, in *La Lumière*, feels himself constrained to expose this "mystification," in which he considers that "the credulity of the writers equals the audacity of the photographer" who produced the pictures. "According to me," M. Gaudin says further, "these images are the results of feeble instantaneous negatives, obtained in full sunlight; and it is their feebleness which produces the illusion of moonlight." He adds that on reading the account on its first appearance, he regarded it as "un puff a l'addresse de riches lords anglais!" Mr. Breese will, doubtless be as much amused as ourselves at the unexpected manner in which he receives his patent of nobility.

But badinage apart, M. Gaudin should be somewhat careful how he suggests the use of the term audacity. Mr. Breese makes a statement, which if M. Gaudin cannot understand, he cannot, at least, disprove. The most which he can, with any propriety, say is, that he himself is not aware of any process sufficiently sensitive to yield impressions by the light of the moon. To this Mr. Breese replies, "Very good; but I do: and my process is a secret." M. Gaudin has set the example in this respect. He has recently, in common with several other persons, discovered a method of uniting in one compound which he calls "photogene," the sensitive salts of silver. So long as the preparation was a comparative failure, he published the details; but on attaining something like success, he announced, not the particulars, but that he would manufacture it for sale. We do not complain of this; we merely point out the analogy of his position, to a considerable extent, with that of Mr. Breese.

Regarding our own "credulity" in the matter, we might content ourselves to smile at the charge. We might add that we had never once expressed an opinion, either way, as to the mode in which the pictures were produced; we simply described the results, and stated that we had Mr. Breese's assurance that they were genuine moonlight pictures, without any trick. But we do not hesitate to go further, and affirm that the pictures themselves bear the strongest possibly evidence to the truth of their claims. They are altogether unlike the results of the small artifice to which M. Gaudin refers, and which, if we remember rightly, was initiated be one of his countrymen. The substitution of weak sunlight pictures, for moonlight effects, is generally easily detected.

In some of these pictures,—one for instance, the moon in the midst of a mass of cumulus clouds—the effect is unmistakeable. Nor does it appear to us a subject beyond the powers of the ordinary collodion process in its most sensitive condition. The moon can be taken, we know well, and we see no reason why the silver edges of the clouds which it brilliantly illuminates should not also be produced. But it is not necessary to argue the case thus. Mr. Breese says, "I have a secret process of unprecedented sensitiveness." Does it need very great stretch of credulity to believe this, and the more so when some exquisite specimens are presented as vouchers?

The whole history of photography has been one constant demand upon such credulity. Each step in its further advancement may be marked by extraordinary demands upon our faith, such as the discovery of unexpected phenomena, or results opposed to or transcending former experience must ever bring. The photographic journalist is doubtless bound to protect his readers from the impositions of boasting charlatans; but he should beware, in speaking of facts with which he has no familiarity, of coupling the terms "audacity" with the experimentalist and "credulity" with the recorder.

PHOTOGRAPHY IN AMERICA.

We recently had an opportunity of conversing with a gentleman who had just returned to this country from the United States, where he had been for some time engaged as a professional photographer. Presuming that some account of what we learnt regarding the practice of photography amongst our Yankee cousins, who are generally considered successful photographers, will be as interesting to our readers as the gossip we had on the subject was to us, we proceed briefly to record the substance of the conversation.

Knowing that the production of glass positives had been practised to a much larger extent, and with greater success in the States, than in this country, we asked some questions regarding their mode of manipulation, &c.

"I believe that the collodion positives, or ambrotypes, for they are always so called, produced in the States are the finest in the world. Some of them possessing very great beauty; brilliant, delicate, and vigorous." Until very recently the ambrotype process was very largely practised; but .is now becoming superseded by the *carte de visite* portrait, the rage for which equalled that on this side of the Atlantic.

"The source of their success in producing ambrotypes," he added, "I can only attribute to the fine light and exquisitely pure atmosphere of the States. The chief peculiarities of their formulæ and mode of manipulating consist in the use of a strong nitrate bath, not less than forty-five grains of silver to the ounce being common; and a highly iodized and bromidized collodion, five or six grains of iodide to the ounce being the usual proportion. They do not generally use nitric acid either in the bath or developer, acetic acid being added to both. The pictures are usually finished without any colour, but a very slight amount of tinting highly coloured ambrotypes not being in request."

We may here explain the meaning and origin of the term ambrotype, which are not usually known in this country. The word was first applied by Mr. Cutting, of Boston, and is thus explained in the specification of a patent in which he claimed the use of bromides in collodion, "by the use of the said process"—the ordinary process now used for producing glass positives—"the beauty and permanency of such pictures are greatly increased, and I have on this account, styled the process 'ambrotype,' from the Greek word αμβροτος, immortal."

"A short time ago," remarked our friend from the States, "there was quite a *furore* for Funnygraphs," as they styled a certain class of caricatures, in which a large head is appended to a grotesque, small body. The head is usually a genuine photographic portrait, to which the diminutive body is added by means of the pencil. A negative is then produced from the print treated in this manner, and printed in the usual card portrait size for sale. We have one before us at this moment of Dr. Kane, the celebrated arctic explorer, by Meade, Brothers. Some of our readers may have seen that an effort was made to introduce a similar style of portraits in this country. The attempt was, fortunately, not successful. We regard the wanton travesty of the portrait of a great man, as about on a par with a burlesque of one of Shakespeare's plays, a production which at its funniest shows a lamentable poverty of invention, and lack of an appreciative and venerating spirit.

The use of iron for developing negatives is universal amongst American operators; various methods of intensifying being adopted when further vigor is required. One method which is very common amongst them, is that we have heard described as often practised by Mr. Wilson of Aberdeen. After the picture is fully developed by the first application of iron, it is well washed, and examined to ascertain if it be sufficiently vigorous for printing purposes. If it be too thin, a little of the silver solution from the bath is poured over the plate, which is then again treated with the iron developer; this process being repeated until sufficient density is obtained. Some of the American operators improve the printing qualities of their iron negatives by the application of hydrosulphate of ammonia, which changes the colour of the deposit from grey to brown, and renders them less permeable to actinic light. Others use bi-chloride of mercury with subsequent darkening solutions: but the pyrogallic acid development is all but abandoned.

Until very recently plain paper was universally used for printing purposes, the reason assigned by our friend being the inability of the American operators to tone albumenized paper. This will be better understood by our readers when we explain that the sel d'or toning process, so unsuited to albumenized prints, was that in general use amongst them. Recently, however, the use of albumenized paper has become more general, and a method has there been adopted with success, which has generally, in this country, been thought inapplicable to albumenized paper, we refer to the ammonia-nitrate process. The usual ammonia-nitrate bath, as experienced photographers are aware, has a tendency to dissolve the albumen from the paper: this tendency has frustrated any attempt to make it available except for plain paper. In preparing the ammonia-nitrate bath for albumenized paper, the American photographers make it considerably stronger than usual, and then add to it a little ether, about one part in sixteen of the solution. The bath so prepared, we are informed, does not dissolve the albumen. If so, we are disposed to attribute it rather to the extra strength of the silver solution than to the presence of ether, which we are inclined to believe would have no effect whatever on the film of dried albumen.

The advantages of the ammonia-nitrate process for albumenized paper are said to be superior depth and richness of tone, and greater sensitiveness. The latter we can readily believe, and the former we are assured is the fact; we have not, however, seen any of the specimens so produced.

The practice of enlarging is, we understand, coming into considerable use in the States, three-quarter figures, life-size, being a favourite style. Woodward's camera is generally used as the means of enlarging; other cameras for the same purpose, announced from time to time as improvements, not having come into much notice.

One of the especially distinguishing features of American photographic establishments, to which our friend refers, is the colossal character of their glass-rooms as compared with those in this country. The glass-room of first-class American establishments usually covers the whole of a very large building, are proportionately lofty, and are surmounted with what they term "mammoth skylights." These large rooms, together with the clear dry atmosphere and fine light, afford unusual facilities for the production of brilliant photographs.

Amateur photographers there are, comparatively speaking, none, and except for the production of stereoscopic pictures, landscape photography is little known or practised.

THE PHOTOGRAPHIC CONTRACT AND THE INTERNATIONAL EXHIBITION.

In a recent issue of the *Times*, the following letter appeared, dated from the offices of the International Exhibition, and signed by F. R. Sandford, the Secretary to Her Majesty's Commissioners.

"The attention of Her Majesty's Commissioners for the Exhibition of 1862, has been drawn to certain erroneous statements which have appeared in the public press, with respect to the contract which they have entered into with Messrs. Birnstingl and Co. I am directed to request that you will have the goodness to make known, through your columns, that this contract refers only to photographing the building during the period of its erection; that it will expire on the 12th of February, 1862, the day on which articles will be first received into the Exhibition; and that in any subsequent arrangement which they may make, Her Majesty's Commissioners will certainly not grant permission to any one to take photographs, or drawings of any work of industry or art which may be intrusted to their care, without the express permission of the exhibitors."

Various rumours have been afloat as to the nature and terms of the contract for photographing the progress of the building. A photographic contemporary announced that the terms of the contract which was accepted, were simply an unconditional offer to double the amount of any other tender. The paragraph to which the letter of Mr. Sandford more especially refers, is, we believe, the following, which appeared in some of the minor prints:—

"A firm in the City, it is said, has secured the right to photograph everything exhibited in the Exhibition, and has, of course, paid handsomely for the right. Tenders were invited, and the firm alluded to offered £7,000, which is double the amount of any other tender."

One part of the statement receives a substantial contradiction in the letter of Mr. Sandford, and as regards the terms of the contract, we have the best authority for stating that all the rumours and statements which have received currency are purely conjectural, and have but little foundation in fact. Regarding the amount of the tender above referred to, the statement is altogether wild and absurd, the sum paid probably not reaching in hundreds the amount stated in thousands. The number of tenders forwarded to Her Majesty's Commissioners was not large, and some of the offers indicated an amusingly small estimate of the advantages to be gained by the privilege of photographing during the time included in the contract. One eminent photographer illustrated his conception of the worth of such an opportunity, by offering as an equivalent, to guarantee to the Commissioners one print from each negative which should be produced under the contract. An eminent West End photographic firm offered a sum of £50 for the privilege; and another, an extensive City photographic house, offered, we understand, £100. This latter sum was, we believe, one of the highest offers. The actual amount paid, and the terms of the contract have not, as we have said, transpired, as we were recently assured by the contractor, that it was a matter solely known to himself and the Commissioners.

The firm with whom the contract was made is that of L. Birnstingl and Co., foreign merchants. The bulk of the photography is executed, we believe, for the contractors, by Messrs. Cundall and Downes, by whom some very fine views of the progress of the building have been already produced. The matter will, again, before the opening of the building, be offered to public tender amongst photographers, and the next contract will necessarily be of a much more extensive character than that at present existing. Those interested will doubtless keep the subject under attention.

EQUESTRIAN PORTRAITS.

Amongst the novelties to which attention has recently been directed, and which will probably come into more extensive demand, are equestrian portraits. We have at the present moment some before us which are very fine, both in whole-plate and card size. It is important to be careful in the selection of background and of position. It is not desirable to fill the plate with the figure; but to include such adjuncts as will make a picture of the whole. The nature of the background and accessories is, therefore, important. A flat piece of country, with the figure of horse and rider cutting against the sky would be very uninteresting. The end of a house, or a high blank wall, would be even worse. A varied landscape having any extreme distance would be unsuitable, because the full aperture, or nearly so, of a portrait lens would frequently be necessary, on the score of rapidity, and much depth of definition, for the distant parts of the landscape, could scarcely be hoped for. A background consisting of sufficiently varied lines to make a satisfactory composition, whilst it furnishes sufficient relief to the figures, should be aimed at. It often happens that there is not much choice available; but we throw out these hints to suggest the importance of making the best of what there is, as we have seen some such pictures in which apparently the subject had received no attention whatever.

In one fine picture before us, the background is very good: the horse, a fine Arab, has just been brought round to the front of the mansion, and is held by the groom. The background consists of the portico with its Tuscan columns, a conservatory, and varied kinds of foliage. In another the same horse is mounted by a lady, the background consisting of the same objects from a fresh point of view. In another picture is a rustic stone wall, above which tower some fine trees, through the branches of which the sky is seen, together forming an appropriate background.

As regards position, although it is not always possible to pose a horse, a good deal may be done by leading it forward a step or two until the feet rest in a satisfactory position, giving the effect of a proper balance of the figure. It is quite possible by inattention in this respect to get a view in which the animal shall appear to have only two legs. We saw a picture the other day, which from the position, and from imperfect definition, gave the effect of having one hind-leg with two feet growing from it, only a small portion of the further hind-leg, consisting of the hock and hoof, projecting before the other.

A spirited position of the head, and perfect quietness for a few seconds, are obtained by a method regarded as an important secret, we believe, by some of the artists in France who are largely engaged in producing equestrian portraits. It consists in giving a shrill whistle the moment before exposure. Immediately the attention is arrested, the head is turned, the eyes brighten, the ears prick up, and a few seconds of perfect quiescence, in a most spirited and desirable position, are obtained, in which to secure and perpetuate the finest expression of the noble model.

Few subjects make more pleasing pictures, and we commend the further prosecution of this branch of photography as one in which profit and credit are to be obtained by portraitists.

INSTANTANEOUS MINIATURE PORTRAITS OR PISTOLGRAMS.

There are few of our readers who will be likely to fall into the error of *Punch's* correspondent, who wrote in a state of extreme nervous apprehension, to enquire what were the unknown horrors which lurked in the "Pistolgrams of Babies," which she saw daily advertised in the *Times*, and one of which she was in constant apprehension that some inconsiderate friend might be presenting to her darling. The term "pistolgram," as most of our readers know, is the name given by Mr. Skaife to the productions of his miniature camera, which from its size, shape, rapidity, and trigger shutter, he has given the somewhat uneuphonious and incongruous name of pistolgraph.

To those of our readers not already familiar with the subject, a description of the instrument and of the mode of working with it as detailed in the "Guide to the Pistolgraph," by Mr. Skaife, a new edition of which is just published, will be interesting.

Mr. Skaife sets out with a declared distaste for the cumbrous machinery of ordinary photography, and for the absence of rapidity which generally characterizes their operations. He manifestly possesses, moreover, a decided love for the minute size of the "photo-gems," the production of his pocket apparatus, and without intimating that the value of a picture increases in the inverse ratio of its size, he regards size at least as a small element in value, and apropos of this subject relates the following anecdote:—

"A Swiss peasant went one day into a watchmaker's shop in Geneva to buy a watch, and after higgling a considerable time over the price of a large old turnip-shaped timepiece, value some twenty francs, at last, by way of finish to the bargain exclaimed, *à moins, Monsieur, vous me donnerez cette petite bagatelle audessus du marché.*"* The little bagatelle was a miniature jewelled watch worth one hundred guineas."

Many of our readers are aware that it is a favourite theory with Sir David Brewster that pictures taken with large lenses are absolutely untrue to nature, as consisting of a series of dissimilar images, produced by different parts of the lens, superposed upon each other. As might be anticipated, therefore, we have his authority to the effect that the photographs produced by the pistol camera are "far more truthful and correct than those taken by the ordinary camera." Without endorsing this opinion, we have no hesitation in assuring those of our readers who have not seen "pistolgrams," that many of them really are gems of positive portraiture; and from their absolutely instantaneous character afford the facility for catching the natural unstudied expression which lends such a charm to a likeness.

The pistol camera is made entirely of metal; brass, we believe, being generally used. Its greatest dimensions do not exceed about three inches. The body of the camera consists of three tubes, the largest little more than an inch diameter, sliding within each other like a telescope. The back, into which the body screws, is large enough to take a plate a little more than two inches long by one inch wide.

It is to the character of the lenses, of course, the extreme rapidity of the pistol camera is due. These are manufactured by Mr. Dallmeyer, and consist of a portrait combination of very short focus and wide aperture. The diameter of the lenses is seven-eighths of a inch, and the aperture generally used for moving objects five-eighths of an inch. The equivalent focus of the combination is, we believe, about an inch, or little more. It will readily seem that the relation of aperture to focus, upon which rapidity depends, is widely different to that usually existing in portrait combinations. In few lenses is the full aperture greater than one-fourth of the length of focus; that is, the proportion frequently found in portrait combinations. In Mr. Skaife's lens we find the full aperture nearly equal to the focal length, and the aperture commonly used at least equal to half the focal length. Here is the source of rapidity which gives unequalled facilities for securing moving objects with shortest possible amount of exposure.

To secure the full value of the rapid action of the lenses, an equally rapid means of uncovering and covering the lens is important. To effect this, a spring shutter, which is patented, is used. This shutter is kept closed by a spring, which may be released for a momentary exposure by means of a trigger, or kept open for a longer period by detatching the trigger and releasing the spring by the pressure of the finger for the time required.

In working with such small plates, as may readily be conceived, it would be very inconvenient to manipulate them in the usual manner. The size of the plate required rarely exceeds one inch square: for convenience, however, the plate is used just twice the length, one half being used entirely for the purpose of holding it. The amount of solution kept in the bath is just sufficient to cover one inch, and the plate is placed in the solution without a dipper, and withdrawn by taking hold of the superfluous glass. In Mr. Skaife's practice all the manipulations, exciting, developing, and fixing, are performed by dipping.

For out-door operations with the pistolgraph, Mr. Skaife has devised a waterproof bag which can be distended into rigidity by inflating certain air-tubes. This bag, which is about the size of a lady's muff, contains the whole equipment necessary for operating. The whole of the manipulations are managed by the sensation of touch, and calculation of time; sight being, for the occasion, dispensed with. The bag contains three small glass jars, one of which contains the nitrate solution, a second the iron developer, and a third a solution of salt and water For these operations each plate has a small piece of glass cemented on to the end by which it is to be handled, by touching which the position of the unseen plate is *felt*, in order to keep it in its right place in each stage. For all objects beyond a distance of about twenty-five feet the pistolgraph requires no focussing, everything beyond that distance to infinity appearing in equal focus. The excited plate being, therefore, placed in the back of the camera, in the dark bag, the instrument is withdrawn and "fired" at any view within range. It is now returned to the bag, developed by immersion in the iron bath, next plunged into the bath of salt and water, and may then be safely examined in white light. It is kept in the bath of salt water until opportunity is found at home for fixing it: the cemented piece of glass allows several plates to be placed in the salt bath without injuring each other. Those whose fancy inclines them to the tiny and minute have thus a photographic equipment reduced to something little more than a waistcoat-pocket affair; and they can, if they choose, enlarge their results at home at leisure, or have them enlarged by means of the solar camera.

Mr. Skaife devotes himself chiefly to the production of "pistolgram" portraits for "chromo-crystals." These chromo-crystals consists of a small glass positive cemented on to a piece of purple or other glass, and afterwards cut into form by the lapidary. The mode of cementing is something similar to that patented some years ago by Mr. Cutting, under the title of "balsam-sealing." Mr. Skaife thus describes the operation of cementing:

"Pistolgram cement is prepared by first filtering Canadian balsam through a piece of fine lawn or muslin, then evaporating it over the flame of a lamp, until the balsam has attained the consistence of amber (when cold). When a pistolgram is required for jewellery purposes, a fragment of the hardened balsam is chipped from the solid and placed upon a piece of dark coloured glass, with which it is intended to back the miniature picture. Then the glass with its superposed amber-like fragment, is held over a lamp until the fragment melts. This done, the pistolgram, previously well heated, is next placed (film side), in contact with the melted fragment, and gently pressed thereupon, until the latter is extended all over between the back and front plates inner surfaces, and its superfluity expelled at the sides, along with all objectionable air bubbles; which done, the compound, when cold, will be found sufficiently

* At least, sir, you will give me this little trifle into the bargain.

homogeneous to admit of being cut to the required shape with a diamond, and finally polished on the lapidary's mill like any other piece of solid glass or stone."

To those who have opportunity, a visit to Mr. Skaife's studio will be found very interesting, an examination of the exquisitely delicate little portraits and park and street scenes well repaying an inspection.

NEW INSTANTANEOUS CAMERA.

Mr. Sutton has recently patented a new form of instantaneous camera. In it the excited collodion plate is placed and uncovered before focussing. The focussing glass is fitted into an aperture at the top of the camera, and therefore at right angles with the collodion plate. Between the two is placed a mirror fixed at an angle of 45°, which arrests the rays coming to a focus on the collodion plate, and throws them up on to the ground glass, which is of course placed at the same angle with regard to the mirror, as the sensitive plate. Whilst the mirror is in this position it protects the sensitive plate from light, and when the focussing is completed, and the subject is ready for exposure, the mirror is turned up out of the way by means of a handle outside, so that the image at once falls on the sensitive plate. The idea possesses much ingenuity, and should no practical difficulty intervene, will doubless come into use for some purposes if its inventor do not create suspicion of its worth by heralding with injudicious praise. We subjoin the following extract from the "Notes," describing some of its features.

"Within the camera there is placed a moveable reflector, making an angle of 45° with the bottom, and which can be turned up and down with pleasure, by means of an external handle, exactly in the same way as Mr. Dallmeyer's instantaneous shutter. The ground glass is placed horizontally in the top of the camera, and when the reflector is down, the image is thrown upon the ground glass *erect* (but reversed as regards right and left),—and this image can be accurately focussed upon the horizontal ground glass by turning the focussing screw of the lens,—and when in focus upon the ground glass it is also in perfect focus upon the collodion film, which is symmetrically situated on the other side of the reflector, and in its usual place in the camera. Thus, when the reflector is down, a pencil converging to a point P upon the collodion film is arrested in its course, and reflected upwards to a point p upon the ground glass,—the points P and p being symmetrically situated with respect to the reflector.* It is hardly necessary to observe, that in order to obtain a correct focus upon both the ground glass and the collodion film, the three planes of the film, the mercurialized side of the reflector, and the ground side of the focussing glass, must all have a common line of intersection;—a condition which can be insured in a well made camera without any practical difficulty, because in making the camera, the ground glass can be accurately fixed in the rebate of the frame after the reflector and dark slide have been fitted in their place.

"The dark slide is put into the camera through the left side, and not through the top; and the shutter is pulled out through the left side.

"The bottom of a camera may be hinged to a piece underneath, as shown in the drawing, in order that it may be easily turned round upon the tripod, and raised or lowered so as to bring a moving object into the field.

"The whole construction being now explained, the mode of using the camera is as follows:—

"First, put into its place the dark slide containing the sensitive film, and open the shutter. The reflector being down no light from the lens can fall upon the plate.

"Next open the lid which covers the ground glass, and throw over your head the black cloth which is attached to the lid, and which is large enough to fall well over your shoulders, and completely envelope the camera, all but the opening of the lens. There is nothing more miserable than a scanty black cloth.

"With the left hand you must now direct the camera towards the object, and when it is in the field upon the ground glass, focus it with the right hand upon the focussing screw.

* In the "Notes" the description is illustrated with a diagram: the points P of course refer to any part in focus on either the plate or ground glass.

"When all is ready for the exposure, take the right hand from the focussing screw and turn up the reflector with it,—or touch the instantaneous trigger which turns up the reflector.

"If the head and shoulders are well covered with the black cloth no light can get into the camera through the ground glass so as to injure the sensitive plate when the reflector is raised; but to prevent all apprehension on this score, nothing is easier than to lay a piece of orange-coloured glass upon the ground glass, which does not at all impede the focussing of the image.

"Portraits can be taken in the manner described, but there is then no necessity for the instantaneous trigger, which can be detached."

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Sulphuric Acid—(continued).—The impurities in sulphuric acid are very numerous, and an exact acquaintance with their methods of detection is likewise of great importance. The chief are, organic matter; an excess of water (which may be regarded in the light of an impurity); hydrochloric acid, nitric oxide, nitrous and nitric acid, potassa, oxide of lead, selenium, lime, magnesia, titanium, arsenic, oxide of zinc, binoxide of tin, sesquioxide of iron, oxide of copper, and mercury; many of these bodies do not dissolve in the oil of vitriol, but merely form a sediment in it.

Organic matter is known when present by its imparting a brown colour to the oil of vitriol. It can be removed by heating the acid to the boiling point, and keeping it so till all colour has disappeared. The carbon of the organic matter will be oxidised at the expense of the acid, and will escape in the form of carbonic acid, accompanied with sulphurous acid.

Water in excess is known by its rendering the acid of less specific gravity, and also crystallizable by a moderate degree of cold. It may likewise be removed by ebullition.

Hydrochloric acid usually occurs through impurities being present in the nitre. It may be detected by treating the suspected acid with peroxide of manganese, which has previously been found to be free from this impurity. If chlorine be present in the sulphuric acid, it may be detected by the smell. Boiling the acid likewise removes this impurity; the ebullition should be continued until the distillate ceases to precipitate nitrate of silver solution. *Nitric oxide, nitrous acid*, or *nitric acid* in oil of vitriol is best detected by the addition of a solution of protosulphate of iron. The solution should be pretty strong, and should be poured on to the surface of the oil of vitriol without allowing them to mix: the solution of the protosulphate should form a layer one fourth as deep as the sulphuric acid. A red or purple colour appears at the common surface of the two liquids. Upon its disappearing after some time, agitation will restore it. Another mode of testing is to mix one part of water with 100 parts of the oil of vitriol, wait till the heat generated has disappeared, and then add the iron solution, in the proportion of one drop to five grammes of the acid. The addition must take place slowly, so that the liquid may not become heated. This reaction is so delicate, that by its means 1 part of nitric acid can be detected in 500,000 parts of oil of vitriol. The separation of these nitrogen compounds from oil of vitriol is a matter of some little difficulty. One plan is to heat the oil of vitriol with a little sugar, until the liquid, which at first turns black, begins to boil, and again becomes colourless. The presence of nitric acid in oil of vitriol may be distinguished from that of nitrous acid, and nitrous oxide, by the following characters: the addition of hydrochloric acid to the sulphuric acid will communicate to it the property of dissolving gold, if nitric acid is present, but this will remain undissolved, if only the other oxides of nitrogen are there. Nitric acid is also shown by the colour of solution of indigo being destroyed when boiled with the mixture of hydrochloric acid and suspected oil of vitriol. One of the most curious properties which a little nitric acid communicates to oil of vitriol is that of dissolving platinum at a boiling heat. This occasions serious corrosion of the platinum retorts, and consequently care should be taken to entirely remove all the nitrogen compounds before the acid is brought into contact with the platinum vessels. This is effected by adding sulphate of ammonia in small quantities to the dilute acid during its evaporation in the leaden pans. The ammonia and nitric acid, or oxide, re-act upon one another with mutual destruction, and formation of water and nitrogen gas.

Arsenic is one of the most serious impurities which can occur in oil of vitriol, and, unfortunately it is also one of the most common. It is derived from the pyrites from which the greater part of English oil of vitriol is made, and exists, for the most part, in the form of arsenious acid, although a trace of arsenic acid is likewise present. A very small quantity may be detected by diluting with twice its bulk of water, supersaturating with carbonate of potassa, separating the precipitated sulphate of potassa by filtration, and washing it with a small quantity of water. The filtrate is to be evaporated, mixed with hydrochloric acid, and thoroughly saturated with hydrosulphuric acid gas. The arsenic will be precipitated in the form of a yellow precipitate, which may have an orange tinge, if arsenic acid has been present along with the arsenious acid. Oil of vitriol is very difficult to purify entirely from arsenic. It will scarcely be within the power of an amateur to effect the purification properly. The most advisable course to pursue will be to test it for arsenic in the above manner, and if any be found to be present, to reject it at once.

Selenium is not commonly met with in English sulphuric acid, although many Continental acids contain it. Dilute the acid with twice its bulk of water, and allow it to cool, add sulphurous acid, and if there is a reddish precipitate, it is most likely to be selenium. Decant the acid from the powder and wash the latter with water. Dry it and burn on charcoal before the blowpipe. A most abominable odour of putrid horseradish will be observed if selenium be present.

Lead is frequently present. It occurs as sulphate of lead, which although insoluble in water is soluble in the strong acid. It will be precipitated as a white powder when the oil of vitriol is diluted with water containing a little alcohol. This last impurity, as well as the remaining ones, viz., *potassa, lime, magnesia, titanium, zinc, tin, iron,* and *copper,* will be left behind as solid residue when oil of vitriol is distilled. The identification of either of these impurities in the residue is a matter of no difficulty to the chemist, but to the amateur who only wishes to know if his sulphuric acid is pure it would be superfluous to descend to such minutiæ; as the presence of any residue at all, shews that the acid is impure.

Before leaving the subject of sulphuric acid a few remarks on some precautions necessary to be taken when working with it will not be out of place. It has already been mentioned that this acid is possessed of the most powerfully corrosive properties. Not only does the concentrated acid char and destroy almost all kinds of organic matter, but very dilute acid has similar properties. A drop of dilute acid allowed to fall upon a piece of linen has no immediate action upon it. The water, however, evaporates from the acid, and the latter, being non-volatile, becomes more and more concentrated until, at length, the first time the fabric is brought near a fire the last traces of water fly off, and the strong acid left at once eats the linen into holes. If any sulphuric acid should by accident fall upon the clothes, not a moment's time must be lost in copiously deluging the spot with dilute ammonia applied repeatedly until a piece of blue litmus-paper, pressed for some time against the spot gives no red tint. On no account should oil of vitriol be permitted to touch the flesh. Some persons can bear contact with this body longer than others, but in most cases severe and slowly healing wounds are the result. Plenty of cold water is the best remedy until every trace of the acid is removed. A little acetate of lead may be dissolved in the latter portions of the water which it applied, and the wound should afterwards be treated as is if it were a burn.

In distilling oil of vitriol, one or two precautions must also be taken. The boiling takes place with violent concussions and sudden bursts of vapour. To avoid the danger of fracturing the retort by these explosions it is best to apply heat only to the sides of the retort by means of a ring gas burner. The insoluble matters collect at the bottom of the retort, whilst the ebullition takes place tranquilly from the sides.

In diluting oil of vitriol with water precautions should be taken to avoid fracturing the vessel by the great heat which is evolved. The acid should be poured very gradually into the water in a thin stream with constant stirring, and the operation should be stopped now and then if the heat rises too quickly.

DEFECTS IN PAPER PRINTS AND THEIR REMEDIES

BY SAMUEL FRY.

It is rather unfortunate that photographers are apt to assume that obtaining prints from their negatives is a very simple, straightforward operation, not involving any peculiar difficulties, and which may be intrusted to comparatively unskilled hands. No error can be greater. To produce really fine paper prints requires as much chemical knowledge, as extensive experience, and as much power to grasp and overcome difficulties, as to take a good negative. We find in printing, the result of what has been justly termed the "unfortunate facilities" of photography, as in any other branch, for it is unquestionably true, that the veriest tyro by adhering strictly to the letter of any work, or instruction, he may receive on the subject, can at once produce "proofs" of some kind or other, generally sufficiently good to please his lenient friends; but if he be really discriminating, he will soon perceive that whatever may be the cause, they are not up to the standard of others.

Printing difficulties may be comprised under the heads of black spots, white spots, flatness, general poorness of tone, mealyness, and measles.

In attempting to explain the cause of these drawbacks, I conclude, as before, that the toning and fixing are made two distinct operations, that it is, I am sorry to say, but too true that many professional photographers still tone by the old hypo, but their prints may be selected amongst any number of others, from their yellow tone and general want of brilliancy, as compared with alkaline-toned prints.

Black spots are in a great measure caused by particles of metal in the paper on which the proof is taken, but another prolific source is from allowing the proofs before toning to lie exposed to air on a wooden or painted surface, as for example a drawer or cupboard; they should be invariably kept in a portfolio; these spots are also caused by keeping the sensitized paper or proofs in a tin or other metal box, instead of between the leaves of a blotting book or other convenient place of the same description. These spots are of necessity almost fatal to the value of the print affected, as it is scarcely possible to conceal or obliterate them from whatever cause they may arise.

White spots are commonly occasioned by a bubble of air being under the paper during sensitizing, but are also frequently caused by dust in the printing frame, or small pieces of paper or wood being between the negative and the sensitized surface during printing, also by dirt on the outer surface of the glass of the frame, which casts a shadow on the inner surface; these causes of necessity suggest their own remedy.

Flatness, when not caused by poverty of the negative, may arise from the silver bath being below the normal strength of 60 grains to the ounce of water, also from the print being insufficiently exposed; again, the sensitized paper may have been kept too long before use, or during printing. The inspection may have been done in daylight, instead of in the dark room, thus causing a degradation of the lights of the picture, and a general want of clearness, and that crisp, sharp decision which the print would otherwise possess. General poorness of tone, perhaps grey inclining to blue, is caused by a too prolonged immersion in the toning bath. As a rule, I find that prints assume their real colour in the subsequent bath of hypo, and will, if the paper contain a suitable proportion of salt, bear removal when a rich brown is attained, but to support this treatment effectually, they must be vigorous negatives, and well printed up.

We next come to mealyness, this greatest trouble of printers under the alkaline system, and one which will never be really removed until a new or improved surface be given to the plain paper before albumenizing, or until some substitute for albumen be obtained, giving a more homogeneous surface, and no liability to run into streaks of varying thickness.

The simplest description of mealyness is that some portions of the picture tone sooner than other parts. With the old hypo bath it was comparatively unknown, because the action was so slow that the solution thoroughly penetrated all parts of the print before toning commenced. We may, therefore, follow out the same principle by making one toning bath weaker when a sample of paper has this failing, and thus allowing, say, from a quarter of an hour to 20 minutes for the toning; also, the bath made with acetate of soda seems to give a greater immunity from mealyness than when prepared either with carbonate, or phosphate, and, therefore, the means I recommend are to use a weak bath of—

Gold	1 grain
Ac. soda	10 grains
Water	1 pint,

and allow the prints to tone slowly in this. It is, I regret to say, the case that there are many papers with which one cannot work without mealyness, but these may often be used for large prints containing much detail and variety of subject in which the inclination to unequal toning will, at all events, be much less apparent than in small stereoscopic or card portrait pictures.

Measles are generally caused from the paper having floated an insufficient time on the bath, and if the bath be also a weak one the evil is much aggravated; they are also caused by the albumenized paper being damp from keeping it in a humid atmosphere; few things are more hygroscopic than unsensitized albumenized paper; it loses its gloss, becomes limp, and the albumen is easily removed from the surface. Imperfect fixation, from the use of exhausted or weak hypo, is the most common source of measles. New hypo, not weaker than one ounce in five ounces of water, should always be used, and the prints should be well immersed and kept moving to prevent them sticking together. Allow me again to reiterate that no error can be more fatal than to conclude that printing is of secondary importance; few negatives, comparatively speaking, ever really have the best prints they are capable of giving, produced from them. If photographers took as much pains with their printing as they do to obtain negatives, a great alteration would soon be seen.

THE INTERNATIONAL EXHIBITION OF 1862:

What are the Arrangements made for representing Photography there?

BY C. JABEZ HUGHES.*

A few days since I took my walks in the neighbourhood of South Kensington, and for the first time saw the great building in the course of erection for the International Exhibition of 1862. I was surprised, astonished, and delighted. I was not prepared for the great progress made. In my mind the intended Exhibition had been a vague, indefinite, unsubstantial possibility; a thing requiring much more talk, and thought, and calculation, and noise, and bother, and puff, and advertising before it could take a material existence. Yet there the great fact stood before me, and a very great one it is. As I wandered down its great length, and gazed on the stupendous crystal towers in the course of erection, I began to realise the vastness and grandeur of the scheme. As the shell typifies the fish, as the cast indicates the model, and the house the tenant, so surely does this vast and grand building imply the magnificent collection of the world's choicest products, speedily to be there collected. With an undying remembrance of the glories of 1851, with a vivid recollection of the Exhibition of Dublin, and the Art-Treasures of Manchester; deeply impressed with what has been done on the *Champs Elysées*, and with what is perpetuated at Sydenham; with these souvenirs fresh in my mind, I look to the new exhibition to eclipse them all.

* Read at the meeting of the South London Photographic Society, Oct. 10.

It cannot have the startling prestige of 1851; nor, falling on less pacific times, will it pretend to herald in a delusive peaceful millenium, but it comes at a more stirring and energetic period, and will bear many of the fruits of which the former great Exhibition only laid the seeds.

Vast and varied however as this mighty collection will be, its distinguishing characteristic will consist in the grand display of Modern Fine Art. All nations will contribute examples of their greatest living and recently deceased artists. La Belle France, young Italy, esthetic Germany, clever Belgium, realistic Holland, even distant Russia, will send their trophies of science, and art, and industry, to compare with the treasures of Old England.

And when this grand collection is brought together; when this galaxy of talent is convened; amidst this very constellation of Genius, we, as photographers, naturally ask, how will our favourite pursuit be represented?

When all the sister Arts are assembled in their choicest and most brilliant attire; Painting glowing with all the charms of colour, and Sculpture in her purest forms: the Industrial Arts, each in its most attractive guise; Music with enchanting strains, and Poetry beautifying and idealising all—in this gay assemblage, and in the presence of Wisdom, and Rank, and Wealth, and Youth, and Beauty, where shall we look for our idol Art?

Will it occupy the distinguished position to which it aspires? Shall we see it appear with its credentials in its hand, and claim a place among the highest Arts, and will its claims be acknowledged and itself welcomed into the inner and charmed circle as the most youthful of the Arts? Will the protecting geniuses Wisdom and Beauty, recognize this young offspring of Science and Art, and placing it on its pedestal call upon all to pay it homage? And, clothed in the robes of beauty, with the effulgent star of Truth on its brow, shall we witness its apotheosis?

Or, to employ humbler imagery, shall we find Photography at the New Exhibition like the celebrated five wise virgins? Will its lamps be trimmed, and will it be ready and equal for the occasion? Or, will it be found without preparation, with no oil in its lamps, so that, like the five foolish ones, when the cry comes it will not be prepared to go in, and then the door will be shut. Should great exertion be afterwards made, large lamps with abundance of good oil provided, and much knocking at the door be made, it will be very mortifying to be told by the Commissioners, We know you not; you complied not with our regulations; you have been more foolish than the foolish virgins, you knew both the day and the hour, and availed not yourselves of the knowledge, and you must submit to the consequences.

It is to be hoped that little of this mortification will be felt, and that photographers, like wise virgins, have availed themselves in time and duly applied for space, and that they have determined to send the best things they can produce. But whatever photographers, individually, have done, in their collective capacity nothing, or worse than nothing, has taken place to represent photography in such a manner as to be creditable to the art or honourable to the nation.

For foreign photography I have not much fear. I have every reason to believe it will be numerously and worthily represented. The same causes have not been at work with them to damp their ardour and check their enthusiasm,

It is for the English portion that I entertain fears. At least ten years will elapse before a similar occasion will occur of displaying the immense improvement in our art, and its endless applications. It was a great misfortune that the Commissioners should have adopted so unfortunate a classification, so far as photography was concerned; but it was a still greater misfortune that the Council of the photography could see no other way out of their position than to abandon the project of a Committee of photographic gentlemen, to manage the photographic section, because the Commissioners would not cede the point in dispute. It is to be lamented that the Council, after having so argumentatively established their case, could not accept the proposal of a separate department for photography. Although photographers are well convinced that this art is entitled to rank among the Fine Arts, yet when the position is controverted they could hardly be expected to be allowed to be judges in their own favour. The Commissioners are not the sole persons who deny it the right. The great body of artists, and they are popularly supposed to be the best judges, say that our art has no place among the Fine Arts When, therefore, the Commissioners offered a separate department they practically said, "We will not debate the question with you, but we will supply you with the means whereby you can substantiate your position; and if it prove that we have done you an injustice, the more credit will be due to you by proving that we, in common with many more, have not sufficiently appreciated this new and rapidly improving art. The verdict being given by competent parties in your favour, we will acknowledge that you have fairly won your spurs, and in future we shall freely accord that place to photography which it has shown itself worthy to hold." The Council, however, saw fit to stand on their dignity, the Commissioners felt they could yield no more; and between these two stools photography has fallen to the ground. The opportunity that was afforded of enlisting the sympathies of all British photographers to exhibit the usefulness and beauties of their art to its fullest extent, is past.

How much more effective the Exhibition would have been if a central committee had been established with a comprehensive plan, and supported by the cordial co-operation of local committees, carrying out the details, as compared with individual efforts working without purpose or arrangement, no one can tell; but the results would certainly be very different.

There can be no doubt a great opportunity is lost, and however photography may gain, nothing like the benefit will arise that might have occurred had full advantage been taken of this rare occasion. In the 1851 Exhibition, photography was a crude, undigested mass. Portions were to be found here, there, and everywhere. Shimmering and glittering on silver, hard and wiry on albumen, woolly and foxy on paper. Without natural guardians, it wandered about the great building, having a home nowhere. It made a small lodgment among the ivory miniatures, was principally to be seen amongst the stationery, was frequently cropping out of the foreign departments, and formed the only brilliant display in the deserted settlements and backwoods of the American department. In 1861 it has its natural protectors; they, however, are not adroit enough to keep it in their own hands, and cruelly allow it to sink or swim, rather than yield a little of their own opinion. When we last assembled here the question was, should a committee be appointed to arrange the proper display of photography, seeing that the latter was placed in a mechanical department; against this we all remonstrated. As I have already said, another offer was next made, that as photography was *sui generis*, to provide a separate place for it, an offer which, under protest especially, might, in my humble opinion, without any loss of dignity, have been accepted, but this also was rejected; and matters are worse than at first, viz., our pictures are still left in their original mechanical location, without even the committee of photographers to overlook, arrange, and advise.

Thus the matter stands; while all other portions have gentlemen to superintend them who are learned and interested in the various details, poor photography stands alone. Who is to take charge of it, or whether anyone is to take charge of it, we do not know. Whether it is to be placed under the tender mercies of the gentlemen who arrange the agricultural instruments or the ship's tackle, we are in doubt; but as the pictures can neither arrange nor hang themselves, it is but natural that we should desire to know to whom they are to be entrusted. It is also of the highest importance that we should know whether any plan or method is to be devised or recommended for intending exhibitors to conform to, so that the few fine days that may occur before the period for sending in pictures may fully be taken advantage of. Will there be any endeavour to form an *historical* collection? Is it desirable to forward the *curiosities* of the art? Ought *processes*, as such, to be specially illustrated? Will morbid photography be admissible, that is, *failures* to which reliable causes may be assigned? Will limitations be assigned as to size, quantity or number of pictures? Are *negatives* to be sent as well as positives? Will any means be taken so that an instructive collection of the various dry processess will be seen? Is there any principle of classification or arrangement to be adopted? Are pictures to be grouped according to size, or subject, or exhibitor? In fact, questions crowd on my mind arising from a natural anxiety that justice should be done to photography, and from a fear that its arrangement may be entrusted to hands that even with the best intentions, may not be able to grasp the character of the subject. Had a committee of gentlemen of well-known ability been appointed, these doubts and fears would not have arisen, for the characters of the committee would have been a guarantee. As matters stand, it is extremely desirable that photographers should be furnished with this information.

It must be borne in mind, that this coming Exhibition is no common one, and that many variations may be required from the usual photographic displays. Our usual Exhibitions are visited chiefly by amateur and professional photographers, their friends and acquaintances, and a small quantity of dilletante persons; the generality of folks never see, and seldom hear of them. But in the forthcoming great show, the great stream of the people will flow past, and tens of thousands will see them who never saw a collection of photographs before, and never will again. For this reason it is I regret that the occasion will not be improved to the fullest extent.

But though it is no use making useless regrets, it is of the utmost consequence that the Commissioners should quickly appoint some gentlemen of sufficient knowledge and technical experience, and, if possible, whose names are well known to photographers, to take charge of, and arrange the whole. It should be their duty to form a comprehensive plan, sufficient to embrace foreign as well as home photography, and to carefully follow that out. Whatever directions are intended to be published for the guidance of exhibitors should be issued as soon as possible, so that all reasonable aid may be afforded them. It is to be hoped that, undeterred by the adverse influences that have been in operation, our best men have been alive to their interests, and have secured adequate space, so that they may honourably shine by the side of their foreign brethren. Lamentable, indeed, will it be, if in our own Exhibition we alone are found wanting. What shall we say for ourselves, when all other artists are striving their utmost to sustain the national honour, that photographers alone make a mean display; and little short of national disgrace will it be, if in the land of Herschel, and Brewster, and Wheatstone, and Hardwich, if the works of her Bedfords, and Williams, and Mudds, and Mayalls, and Heaths, and Claudets, and Lacys, and kindred artists, are not present in sufficient abundance to do honour to the great names of Talbot and Archer.

MATHEMATICAL PHOTOGRAPHIC INSTANTANEITY.

As a point is to magnitude in geometry, so is instantaneity to time in photography. Time is duration with beginning and end, but instantaneity is beginning and end without duration.

All operations in chemistry, optics, and mechanics, requiring time for their operation, strictly speaking there can be no such thing as an instantaneous photograph executed by man or physical means, until light, enfranchised from that which restricts its velocity to 98,000 miles in a second, becomes as free as thought to visit the most distant object as quickly as the nearest.

Popular Photographic Instantaneity is as latitudinarian as the terms long and short, some holding that an instantaneous photograph is one taken in a second; others, as quickly as the dark slide can be lifted up and down, or the cap of the lens taken off and on, or "as quick as possible."

The writer, in his search after the "instantaneous," recollects being enticed into a photographic studio in Regent Street, by "*Instantaneous portraits taken here*," but upon trial the "*instantaneous*" turned out to be a thirty seconds' affair.

The best, oldest, and most reliable test of instantaneity, in a popular sense, is undoubtedly "the twinkling of an eye," the quickest as well as most uniform voluntary movement common to man and beast. It has been stated by scientific Opticians that the image of an object once falling on the eye's retina, cannot be removed therefrom in less than one-tenth of a second. The twinkling of an eye comprises a closing and opening movement during which the eye is darkened for the space of one-tenth of a second, The very trifling obscurity of vision which takes place during this natural twinkling of the eye with most persons when reading, countenances the hypothesis that this movement was adjusted with a regard to the time which light rests on the retina. Taking these two remarkable coinciding phenomena as data whereby to distinguish practically the instantaneous from other movements, we shall find that as a flash of lightning passes unperceived by eyes happening to be in the act of twinkling at the time, therefore lightning may be regarded as instantaneous, as whether it passes in the tenth of a second, or less than the ten-millionth part of a second, the unassisted eye has no means of ascertaining. On the other hand, a movement which is begun and not ended during the twinkling of an eye (that is in the one-tenth of a second), as it cannot escape the observation of a looker-on, therefore such a movement in a popular sense is not instantaneous, seeing the unassisted eye can take the measure of its duration.—*Skaife's Guide to the Pistolgraph.*

CARTES DE VISITE.

(*Condensed from the Art-Journal.*)

Never was a nomenclature based upon the principle of *lucus a non lucendo* exemplified in a more characteristic manner, than in the instance of the delightful photographic miniatures that now are universally popular under the title of *Cartes de Visite.* They are neither regarded nor used as visiting cards, nor does anyone think of applying to them a plain English designation to that effect: and yet everybody understands a *Carte de Visite* to be a small photographic portrait, generally a full length, mounted on a card; and everybody is also equally anxious both to obtain his or her own miniature, executed in this style, and to form a collection of these *Cartes de Visite*—the portraits of everybody else. For the present, apparently, the most popular, the most deservedly popular also, and by far the most numerous class of English portraits must be content to be known by an inapplicable, and indeed an unmeaning French name: perhaps, in due time, the *carte de visite* fashion of to-day may subside into what we certainly hope will prove to be an enduring admiration for sun-miniatures—portraits, that is, of precisely the same order, but bearing a simple and becoming English title.

Meanwhile, however strange the misapplication of the term *carte de visite* may have become in its prevailing use, the photographic miniatures themselves, certainly, are most felicitous expressions of the photographer's wonderful art. They are such true portraits, and they are so readily obtainable, and so easily re-produced, that they may well aspire to become absolutely universal. Few, indeed, are the individuals whose personal lineaments are not regarded with especial sympathy by at least a small group of loving friends; and, on the other hand, no less limited is the number of those persons who do not cherish the associations that are best conveyed by means of the portraits of the loved, and esteemed, and honoured. And then we all have a peculiar liking for our own portraits, and we always like them to be liked. So sun-miniatures are certain to prevail. Already they have attained to a position in the front rank of the Art-productions of the day, and, from their present eminent condition of popular approval, they are constantly making still further advances; and they will, in all probability, continue to increase in public esteem so long as they are executed with skill and feeling, and they remain true to the simple fidelity of genuine portraiture.

It seems but the other day that photography itself first appeared amongst us, sent as on a fresh sunbeam, and took its place with the most recent of the Arts; and now we see several distinct classes of photographs, to each of which may be properly assigned the rank of an independent branch of photography. These *cartes de visite* in themselves constitute what we may even entitle an Art. They multiply national portrait galleries *ad infinitum.* They produce the family portraits of the entire community. They form portrait collections, on a miniature scale, but with an unlimited range and in every possible variety—family collections, collections of the portraits of friends, and of celebrities of every rank and order, both foreign and of our own country. Nobody now needs to inquire what such-or-such a person may be like, or to be left to such surmises as written descriptions may convey of features and figures that cannot be actually seen. An ubiquitous *carte de visite* can always find its way with certainty and speed, and it is the best of all possible introductions, as it is the most agreeable of reminiscences. When our friends leave us, they leave with us these precious images which we can always and everywhere carry about with us, to feast our bodily eyes with their graphic representations, as memory is able to treasure up and to pass in mental review incidents that the past has taken with it, and words whose echoes have long ago died away. And when fresh connections are formed, or when new links are added to old chains, the ever-available *carte de visite* is ready to make known to us here at home, in *propriâ personâ,* a far-away new daughter-in-law, or the number one (or the number whatever you please) of another generation. We now look with commingled surprise and scorn at the painful efforts at family portraiture that preceded the photographic era, and which resulted in either pallid libels, brush-produced upon ivory, or black paper reductions of shadows in profile, cut out with scissors, and closely allied to architectural sections. These black paper enormities admonish us that but a single step intervened between that first tracing of a much-loved shadow on the wall at Corinth, and the almost breathing and sentient portrait of the *carte de visite.* And, let us be duly grateful to him; the same sun that inspired the Greeks with the happy thought of fixing a shadow, now gives us our perfect portraits—portraits that would have turned the very brain of Apelles himself, and which in common justice we ought to have called, not photo, but helio-graphs. And not only in the case of black profiles and feeble miniature "likenesses" does the *carte de visite* at once effect the most marvellous of revolutions in collections of family portraits, but also in comparison with the highest orders of miniature-pictures the little sun-portraits are well able to maintain their reputation. Thorburn gave up his miniatures just at the right time, as if influenced by a prescient impulse that an artist more potent even than himself would soon be at work, executing first-class miniatures for the million, and reproducing them with a corresponding ease and rapidity, Elaborately painted miniatures now are artistic curiosities, few in their numbers, and rather calculated to associate the present with the past, than to convey ideas in conformity with the spirit of an age that looks forward with so ardent a gaze. Very beautiful little objects are those miniature paintings, when they are really the work of true artists, and they always will be regarded with a loving admiration; but, reversing the process that acclimatises plants, they have grown into exotics, while the *carte de visite* are favourites that find a congenial soil in every spot, and flourish in every region, multiplying their numbers daily by tens of thousands.

In addition to what they accomplish in providing for us all such delightful miniatures of our families and friends, and of our own selves also, *cartes de visite* confer positive blessings in supplying us with faithful and thoroughly artistic portraits of individuals for whom, without including them in the ranks of our personal friends, we entertain a profound respect and perhaps a warm regard. And the same feeling which invests with their own peculiar charm the portraits of those whose lot in life is cast in close connection with our own, expresses itself with a suitably modified earnestness in reference to the portraits of the honoured, the respected, and the admired. Second only in our esteem to our private portrait collection, is what we distinguish as our collection of portraits of public personages. Here *cartes de visite* expatiate in a field that positively knows no limits; and here also they exhibit in the most striking aspect their peculiar faculty of uniformly excellent reproduction.

Whatever our special taste in Art, or literature, or science, we can select *cartes de visite* which will form for us our own collection of the portraits of the artists, the authors, or the philosophers whose names to us are as "household words." It is the same in politics—a *carte de visite* is equally really for us, whether we prefer Derby or Palmerston, Lyndhurst or Brougham, and in either case the portrait sets before us the very man. We might multiply examples in every possible department of public life; we might single out our most eminent officers and our ablest civilians—we might select the individuals who signally adorn the professions, whether the church, the bar, or of medicine, and we might pass on to public favourites of every varied calling; but, without attempting any such detailed illustrations of the versatile capacities of *carte de visite* miniatures, we are content to refer to the personal introductions which these wonderful portraits have effected for us to two individuals only—two men, not Englishmen, but men whom Englishmen delight to honour, the one still living in the fulness of his fame, and the other lamented as well as honoured—Garibaldi and Cavour.

The extraordinary popularity of the photographic miniatures we are considering, naturally has produced a very numerous array of professing artists, ready to execute whatever *carte de visite* may be required. In London alone many hundreds of establishments of this class exist, and the greater number of them flourish; and, in like manner, scarcely a town can be found which does not possess its own resident photographer. It must not be supposed that all these artists by any means approximate to a common standard of excellence in their several works. We are not able to express any opinion relative to very many provincial photographers; but we certainly have seen many *cartes de visite* from the provinces, that are highly creditable to the artists by whom they have been executed. In London there are many photographers of the highest eminence, all of whom produce in vast numbers these ever-attractive miniatures; and the able artists are well diffused over the metropolis, so that there exists no difficulty in finding out an establishment at which even a stranger to London may have his miniature well taken in photography. Even more numerous than the establishments for producing them are those at which *cartes de visite* are offered to the public for sale. They enjoy, too, a peculiar reputation, as it would seem, which leads them into a strange association with other objects, with which they would apparently have no kind or degree of sympathy. These photographic miniatures are exhibited and sold by persons whose establishments have no other connection with works of Art. They are in universal request, however, and so everybody thinks that he may quite consistently take a part in providing the requisite supply; and, if these portraits thus often find themselves in unexpected association with objects between which and themselves there can exist no possible sympathy, still more singular is that association which is apparent in the portraits displayed by *cartes de visite*, where they stand at the windows in long rows, tier above tier. The windows of he Photographic Institution, adjoining Bow Church, in the City, for example, afford abundant materials for reflection upon the contingencies of unexpected aggroupment. There, and in many other places also, the most curious contrasts may be drawn, and the most startling combinations effected. Of course all these combinations are purely casual; but it is their casual origin that constitutes their singularity; and, after all, when even the most hurried of passing glances reveals to us fac-simile images of Lord Shaftesbury and Cardinal Wiseman, and of the French Emperor and Sims Reeves side by side, with those of Florence Nightingale and Blondin and Professor Owen forming a trio, we are reminded in a manner the most impressive that *carte de visite* miniatures are creations of the present day, portraits of our own actual contemporaries. These photographs are essentially novelties—they belong to the present; with the past, except with so much of it as has been very recently the present, they have no connection whatever; as we have said, they are contemporary portraits—portraits of the men, and women, and children of the living generation. And the strange composition of many groups of these *carte de visite* portraits may not inaptly suggest to the originals that they, like their portraits, might take no harm from associations which now they probably would regard with sentiments of aversion and even of horror: indeed, much of mutual benefit might be derived from very many persons coming into contact one with another, who now stand sternly apart; and certainly, very many persons might confer most important benefits, even though they received nothing more than a fresh lesson in experience, through occasional association with both classes and individuals that now are absolutely unknown by them.

We cannot take leave, for a time, of these most interesting photographs, without adverting to the skilful manner in which albums and other receptacles for the portraits have been produced. The novelty of the arrangements for introducing the cards, and the felicitous manner in which the portraits are at once displayed and preserved, merit the strongest commendation. These books and cases abound, in every variety of form and size, and style of embellishment. Like the stereoscope, at least one of them must find its way into every family circle; and, without doubt, both the stereoscope and the *carte de visite* album will never cease to enjoy the hearty and cordial sympathy of every intelligent individual.

Proceedings of Societies.

THE MEMORIAL OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY TO HER MAJESTY'S COMMISSIONERS FOR THE INTERNATIONAL EXHIBITION OF 1862.

The South London Photographic Society having noticed with concern that notwithstanding the season for successful photographic operations is drawing to a close, and the period of the International Exhibition is rapidly approaching, no regulations or instructions for the guidance of photographers have yet been published, nor has any committee or list of gentlemen to whom the arrangements for controling this department have been entrusted, been announced. The South London Photographic Society had hoped at their last meeting that the negotiations then pending between Her Majesty's Commissioners and the London Photographic Society would have terminated in the appointment of a committee, but such negotiations having unhappily failed in producing this result, the South London Photographic Society take the opportunity at this their first meeting after the summer recess, of expressing their approval of the decision of Her Majesty's Commissioners as regards the separate department promised to photography, and of respectfully representing the importance of the following considerations:

That a committee of gentlemen familiar with and interested in photography, and of well-known attainments in connection with the Art, should be appointed and announced to photographers, as having the direction and control of the Photographic Department.

Photography comprehending, as it does, various and distinct departments, such as illustrate its scientific progress and its various artistic and economic applications in portraiture, landscape, architecture, astronomy, magnetism, meteorology, physiology, psychology and many other departments, and a proper arrangement of all these departments depending on technical familiarity with the Art generally, renders the appointment of such committee of vital importance.

That to secure a successful representation of the Art, a comprehensive plan of arrangements should be devised and published, in order that photographers may, in their preparations for contributing, conform thereto, and so co-operate in the production of a successful result honourable to this country.

That whilst many other important considerations, in connection with this subject crowd on the mind of the memorialists, they do not deem it prudent here to trouble Her Majesty's Commissioners with questions of detail. But beg once more to press upon their attention that the successful issue of this department of the Exhibition depends almost entirely upon the decisions which shall be now made and published regarding it.

The South London Society, in conclusion, beg to tender such service as they may be able to contribute to aid Her Majesty's Commissioners in carrying out any decisions at which they may arrive in relation to this important subject.

NEWCASTLE-UPON-TYNE PHOTOGRAPHIC SOCIETY.

THE first monthly meeting, after the recess, of the Newcastle-upon-Tyne and North of England Photographic Society was held in the Tower, New Bridge Street, on the 4th inst., Mr. P. M. LAWS in the chair.

A letter was read from Mr. Thomas Sutton, of Jersey, the late lecturer on photography, in King's College, London, in which he kindly promised to send a paper to be read at the November meeting.

The secretary called the attention of the meeting to a new camera, by Mr. Sutton, for taking instantaneous pictures. He spoke highly of the improvement as one very valuable, and well worthy the attention of photographers generally. Mr. Birnie described the part of the camera in which the novelty consists, as given by Mr. Sutton in the "Notes."

After some further conversation on the subject the proceedings terminated.

Correspondence.

TAXES FOR PHOTOGRAPHY.

SIR,—As a travelling photographer, I fancy that the vigorous crusade which is going on against us poor sinners, is not altogether guided by charitable motives. I think that it must be admitted that there are as many fixed resident "bunglers" who are, and ever will continue to be, a disgrace to the profession, as there are "travelling bunglers," and therefore beg to submit that taxing one and not the other, would be very unjust, and would fail to cure the evil so much complained of. Far from escaping expenses as W. B. N. would have it, I contend that travelling photographers are at more expense than fixed residents. My own for the past year are for moving twice, cost of repairs, &c. and interest ($7\frac{1}{2}$ per cent.) upon money laid out upon the building the two vans, £61 7s. 6d. Very few residents in provincial towns pay more than this sum, for *rent* and *rates*. I have nothing new to propose, although I must beg to disagree with W. B. N. I see no plan like that suggested by yourself, *i.e.*, examinations, &c., to protect the dignity of photography. Trusting you will pardon me for thus intruding upon your space, I am, very respectfully, J. M. P.

Oct. 8th, 1861.

Hints to Operators.

ECONOMY IN GLASS PLATES.—The use of patent plate glass for large sizes, especially where the number of negatives accumulated is great, soon becomes both to amateur and professional a very serious item of expense. The great objection to the use of flatted crown is, not the quality of the surface, which is often as good as that of plate, but the chance of breakages in the pressure frame. By means of a very little extra trouble, this risk may be avoided, and the expense of patent plate escaped. The real proportion of breakage in flatted crown is comparatively small, the difficulty consisting in the fact that such breakage may occur in a valuable negative. This then may be avoided by taking each plate of flatted crown and trying it in the pressure frame before using it. Those that will not stand the pressure will break and the fragments may be used for other purposes. Those which bear the test once may be expected to do it again, and negatives may, without much risk, be produced on them. White glass should be avoided for negatives, as it is apt to sweat and cause the film to crack.

LIGHTING AND POSING.—Always avoid a window in front of the sitter. Too much front light is fatal to the perfect modelling, and has a tendency to give a flat, broad effect to the features, and make the eyes light, fishy, and expressionless. A direct vertical light, on the contrary, makes the eyes heavy and dark, and casts shadows under every projection, brows, eyes, nose, and chin. Where a profile is chosen, and it might more often be used with good in photography than it is, the face should be turned somewhat from the light, in order to get fine modelling. Howard, in his *Imitative Art*, says, "A profile will be made most intelligible by introducing the light rather behind the head, so as to throw the receding boundaries of the front of the forehead, eye, cheek, nose, and chin, into a half tint. The principal lights will be on the upper part of the temples, the cheek-bone, and the ear; and the principal shadows under the hair, upon the cheek and temples, and under the eye-brow close to the nose. The whole of the front of the iris of the eye will be light, except close under the eyelashes. The pupil of the eye will be scarcely visible, but the eyeball will appear darkest where the pupil is known to be.

ALCOHOL IN THE DEVELOPER.—It is very common for the various formulæ given for developing solutions to contain a specific quantity of alcohol, as though it were a necessary part of the developing power. Its real use is simply to cause the developer to mingle freely with the nitrate of silver solution on the plate, and thus to flow without greasy-looking lines, which would cause stains of unequal development. When the nitrate bath is new, the developing solution should contain no alcohol, as its presence in the developer would cause the very defect it is usually intended to prevent. It is only when the bath has acquired a little ether and alcohol from the continued immersion plates, that alcohol should be added to the developer, and then of only just in the proportions necessary to suit the condition of the bath. For this purpose methylated spirit will answer just as well as pure spirits of wine or alcohol.

Miscellaneous.

PHOTOGRAPHING FROM BALLOONS.—At a recent meeting of the American Photographical Society, the President read a copy of a letter which he had addressed to the Secretary of War, stating the opinion of the society that photographs might be taken from balloons which would be of great value in military reconnoissances, and offering the services of the society in aiding the Government to employ this valuable power. The President remarked that though the letter was sent more than a month ago, he had received no answer to it. This neglect he attributed to the overwhelming mass of business which the Secretary of War has on his hands. Mr. Seely remarked that probably the secretary was not aware of the practical value of the aid tendered. A photograph from a balloon would be a perfect and minute record of the country observed, which might be examined under the microscope, and details brought out which would be invisible from the balloon. Mr. Tillman regretted the inattention to their offer, but could see nothing further for the society to do in the premises.

NEW PASTE FROM WOOD.—A new paste, designed to take the place of glue and starch for many purposes, has been lately manufactured. It is made as follows: The wood is first reduced to fine shavings, then these are boiled in a strong lye of caustic soda or potash until all the fibres are separated. The best woods used for making the paste are poplar, pine, beech, spruce pine, and most woods termed "soft." When boiled, a sufficient length of time for the softening of the fibres of the shavings, the fibrous matter is withdrawn into open vats, and exposed to the air for several days, when it ferments, and the whole mass becomes soft and glutinous. It is now cut up in machines like those employed in paper mills for cutting and grinding rags to make paper stock, when it becomes fit to be boiled in water, and is converted into a vegetable cement.

DECOMPOSITION OF GUN-COTTON.—At the last meeting of the Academy of Sciences, M. Bonnet communicated certain remarks on the spontaneous decomposition of gun-cotton under the influence of diffused light. The gun-cotton on which he observed this action of light had been prepared in 1856—that is, four years before its decomposition. That which became first decomposed had been prepared with a mixture of nitrate of potash and sulphuric acid, while another sample, which was decomposed later, had been prepared with a mixture of nitric and sulphuric acid. In both cases the decomposition was preceded by the appearance of red vapours; but in the first case the action was much stronger, since the stopper of the phial was forced out, and the neck was cracked. In the same case the residue of the decomposition had the appearance of a substance which had once been liquid, being full of solid bubbles; in the other case, on the contrary, it was compact and strongly agglomerated; in both cases the sides of the phial were covered with small crystals of oxalic acid. The atmosphere of the second phial was acid and attracted water; the acids it contained were carbonic and formic acid.—*Mechanic's Magazine.*

Talk in the Studio.

Stereographs of Cornwall.—Mr. Wilson has, we understand, taken some instantaneous negatives of the Land's End, Logan Rocks, &c., but although he waited three days, could not, on account of the fog, get a picture of St. Michael's Mount. He intends, we are informed, to visit Cornwall at some future time to complete his views of the Cornish western scenery. These pictures should be in every collection.

A Hint to Photographers.—In a recent article in the *Cornhill Magazine* on "Physiognomy," attention is called to the important contributions photography can make towards establishing a systematic physiognomical science. The following paragraph from the article will interest our readers :—"It is necessary to point out that the physiognomist has never yet had adequate materials wherewith to build up a science. The diversities of physiognomy are infinite. In the whole visible world there is no class of appearances so varied, and in their significance so subtle as those of the human form. Fuseli wrote on one occasion :—'Let the twelfth part of an inch be added to or taken from, the space between the nose and the upper lip of the Apollo, and the god is lost.' That is too strong a way of putting it. The god remains in the Greek marbles even when his nose is broken off. It is not in any one feature that he resides, but in all. Let the statement pass, however, as indicating in a rough way what a clever painter and man of genius thought as to the astounding differences of character expressed in evanescent differences of external form. Now, in order to be able to generalize with anything like success all these subtle shades and variations of contour, we require an immense number of accurate observations, and to have them side by side before us, so as to be able to form a comparison. This we have never yet had. Lavater gives a great number of portraits, and he had many more in his collection, but he was always complaining that they were unreliable. In this one the nostril was out of drawing; in that the chin was a falsehood; here the eye was uncertain; there the hand was nothing at all. Especially in the hand have the portrait painters failed, and there is nothing that the physiognomist is so much in want of as a good collection of hands. It is to be hoped that the discovery of the photograph will prove to be the dawn of a new day for him. As the science of chemistry was nothing until a perfect balance was invented, and as the science of physiology was really unknown until the microscope was improved, so it may be that the faithful register of the camera, supplying us with countless numbers of accurate observations, will now render that an actual science which has hitherto been only a possible one. We shall get a great variety of heads, and be able to classify them according to each separate feature, and according to each leading trait of character. Above all, when once the attention of the photographers is called to the want, we shall begin to get hands—hands by themselves, and hands in connection with faces. These are facts which we have only now for the first time the means of getting in sufficient number. The portraits we have had have, for accuracy, not less than for number, been very insufficient. It is not so much portraits that we have had, as engravings of portraits, and engravings after engravings, the representation being thus at third and fourth hand."

To Correspondents.

H. Newman.—See recent articles on printing and toning in our pages by Mr. Leake and by Mr. Fry. There are various modes of transferring the film from glass to leather, &c. The following is a good method :—Take the picture with a strong-bodied, tough collodion, and after completing, let it dry. Then take alcohol to which nitric acid has been added in the proportion of about 10 drops to one ounce, and pour on and off the film a few times, and treat the leather the same way. Now place the film in contact with the leather, taking care to avoid air-bubbles; and place them in a pressure-frame for about half an hour. On removing the leather the film will leave the glass and remain attached to the leather.

X. Y. Z.—The best method of dealing with a scratched negative is to touch out the defects with a suitable water-colour. Cadmium yellow is very good for the purpose. The spots in the print are then white, and are easily touched out so as not to show. 2. In mounting stereographs it is easy to put each half in the proper place without testing. See that you have always about 2¾ inches from centre to centre; and if there be a little more of one side of the subject in one print than the other, see that the excess on the right picture be on the right side of that picture, and *vice versâ*. You will find this answer as a general rule.

W. Bircham, jun.—The recent postal arrangements with France extend the facilities of the book-post to that country. We have not yet seen the rate of charges. Your stereographs will be noticed shortly.

Nib Stanni.—We are pleased with your letter. It is conceived in the right spirit. Thank you for the paragraph.

G. E. W.—We can only counsel persistent application to the Postmaster-general.

E. Hanaway.—Consult our advertising columns, and procure the catalogues of various houses. We cannot here supply lists of prices.

F. Y. B.—The best means of enlarging on to paper from a small negative, is by the solar camera. Failing that, and following the plan you have been trying, you require all the light you can possibly get. If you could contrive to point the camera containing the negative to the zenith, it would be best. Next to that, a clear north sky. The tracing paper will shut out a good deal of light. If you are circumscribed by the position of your room, remove the tracing paper from the hole in your shutter, and, unless it command an uninterrupted expanse of sky, place outside, a mirror of an angle of 45°, after the fashion of the "daylight reflectors." The negative should be placed in the aperture of the shutter. With bromo-iodized paper and a strong silver bath, half-an-hour's exposure in a good light ought to give sufficient image for development. The paper is more sensitive exposed wet. But the solar camera gives by far the finest results.

C. F. Riversdale.—There was a transposition of the sentence, see *erratum* below. The iodine formula in our year-book was that originally suggested by Barreswil and Davanne; that we have recently given is weaker, in order that it may be more easily managed by inexperienced hands. The proportion of acid in a developing solution must vary with circumstances. The best proportion of citric acid is one part to two of pyrogallic; but in hot weather they may be used in equal parts. In using acetate of iron, use free acetic acid, not citric acid; the proportion according to temperature and condition of other chemicals; always use the least acid that will prevent fogging and staining. The front lens of your portrait combination, reversed, will answer for views, if it be mounted in such a mode as permits its use in that manner. Beaufoy's acetic acid is manufactured of various strengths; when no strength is named you may regard it as one-third of the strength of glacial acetic acid. The articles on iron negatives will be resumed shortly.

W. May.—Received.

N.—We are obliged by the charming vignettes; they are of Blackwater if we mistake not. The negative appears to be as good as the subject is lovely. The prints leave little to be desired, and are certainly from some cause superior to the usual results from weak baths. You favoured us before with two or three copies from the same negative, which, with these, are all distributed amongst appreciating admirers of good photography. In regard to the mode of estimating the strength of solutions, a measured fluid ounce of distilled water at 60° should contain 480 grains by weight, or one ounce avoirdupois. All chemicals, in preparing formulæ, should be weighed by the same standard, so that 1,800 grains of silver dissolved in 20 ounces or one imperial pint of water, will give you correctly a 90-grain solution. That is the usual mode of estimating the formulæ.

A. Melhuish.—Received.

Old Cove.—The same bath may be used for both positives and negatives; but not with the best results for both. To produce good positives it is desirable that the bath should contain considerably more acid than for negatives. Where only a few positives are required, and first class tones are unimportant, they may be produced in the negative bath. 2. Ironing prints will improve them; but it is not nearly so efficient as rolling. 3. The best colour for a background will vary with circumstances, but a somewhat dark grey is the most useful for general purposes.

J. P. E. desires to thank E. E. L. for his suggestions a few weeks ago regarding some defects in albumenized paper. 2. The only effectual mode of getting rid of the vapours of ether in the dark room is by ventilation. Whenever it is possible, have a draught through the dark room; good ventilation is often an aid to good pictures as well as good health. We shall be glad to receive the description of your developing stand.

Spoon Plate-holder.—A correspondent writes to inform us that having, according to the suggestion in a letter in our pages some weeks ago, sent a shilling's worth of stamps some weeks ago to Mr. Rendle of Ilfracombe, for a spoon plate-holder, he has been unable to obtain either the article or any kind of acknowledgment.

S. S.—Some new rules of the Stereo Exchange Club, will probably be established shortly, and will then be published. A portrait lens may be used in a magic lantern, if you have a room long enough. Several articles on this subject have appeared in the present and former volumes of the Photographic News.

An Aspirant.—The Dallmeyer stereo lens might be used for card portraits with sitting figures, but it is scarcely well suited to the purpose. Card portraits are frequently required in a standing position, and a space of three inches on a perfectly flat field can not be equally defined all over with a lens of 4½ inches focus. Card portraits should be taken either with a lens of long focus, or with one made expressly for the purpose.

J. Linden.—We fear that there is no lens to be obtained with which you can secure a perfectly defined standing figure on a quarter plate at a distance of eight feet from the object. Twelve feet will be required at least; a greater distance and longer focus would be still better. 2. The use of ammonia before toning will make that operation slower. We do not use it ourselves. 3. The addition, of too much nitric acid to a printing bath will make the paper less sensitive and require more time in printing. You can, if necessary, neutralize with oxide of silver. 4. The print forwarded is under-exposed, and the lens is not equal to the work.

Erratum.—In our answer to A. B. C. last week there is a transposition which reverses the meaning of the sentence. For "prints should always be fixed before toning," read, "prints should always be toned before fixing."

Maxwell Lyte, Lux, S., J., L., J. Walter, and several other correspondents in our next.

*** Our Correspondents will aid us in our endeavours to solve their difficulties if they will in all cases state details of their operations when failures occur; and when referring to former articles in the News giving the exact reference. Letters intended for the Editor should be addressed expressly to him.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 163.—*October* 18, 1861.

THE PHOTOGRAPHIC EXCHANGE CLUB.

The Stereoscopic Exchange Club, established by the conductors of this journal, has, during two years and a half of its existence, been more extensive in its operations, and more successful than could possibly have been anticipated from a new and untried scheme. Many thousands of stereographs have changed hands through its agency, and very many of our readers are now in possession of an extensive and interesting collection of slides, which would have been unattainable by any other means. The members have secured by this method of private circulation a public for their productions, and have at the same time increased their variety of subjects for the stereoscope from tens, to hundreds or thousands. So far well: the club has more than fulfilled its mission.

There have arisen, however, from time to time, certain elements of dissatisfaction. There have been amongst the members some who, from ignorance, or from the absence of a delicate feeling of honour, have sent exchanges of very inferior quality to those they have received. The conditions of admission to the privileges of the club were that each member should send for our inspection an average specimen of his productions. In some few instances, not many, the specimens were so inferior that we could only counsel the applicant to be more careful, aim higher, or practise more—admission into the club with such powers being out of the question. We regret to say, however, that we have had some specimens sent to us from aggrieved members, who had received them in exchange, which were infinitely worse than the worst sent to us as average samples. Cases such as these, and some other circumstances, have led us to consider the suggestions of several correspondents, and to re-organize the club on a new basis, which will, we apprehend, effectually remove all sources of unfairness and consequent distisfaction, and lead to an extended system of advantageous exchange.

The plan we now propose for adoption, after a due consideration of all the suggestions made, and consultations with some of those most interested in the old club, will remove the responsibility from individuals to a committee of referees. Instead of exchanges taking place between individual members whose names are published, all pictures intended for exchange are to be forwarded to the secretary of the club. Once a month a committee of gentlemen, who have undertaken the duties of referees, will meet for the purpose of examining the pictures sent, and arranging the exchanges. Their aim will be to forward to each member pictures of equal merit with his own. The value of the pictures received by each member will, therefore, be in the direct ratio of the value of those he sends. Good photography will be exchanged for good photography; artistic, rare, interesting, and well-chosen subjects will be exchanged for subjects of the same calibre. On the other hand, bad, or slovenly photography, inartistic or common-place subjects, will meet with returns of the like quality; or if any be received transcending in badness all others, they will be returned as unsuitable for exchange. We are supposing an extreme case: we do not imagine that anything worthy of "that bad eminence" will ever be forwarded. But, in any case, justice will be done; every member will receive a fair equivalent for the pictures he sends. There will be, therefore, a strong incentive, to every one desirous of possessing a fine collection of photographs, to send good prints from his best negatives.

We may here mention an important consideration in connection with this part of the subject. In order to emphasise the idea that one good photograph is worth any number of bad or indifferent ones, any member having one thoroughly good picture, may, if he choose, send a dozen, a score, or a hundred copies of it for exchange, and receive copies of the best productions of every other member in return. It will not be necessary, therefore, that any gentleman wishing to avail himself of the advantages of this exchange, should have a large number of negatives. If he have one or two of pre-eminent excellence, he will contribute as usefully to the exchange, as those whose number is legion, and at the same time equally increase and improve his own collection. It will be desirable in such cases that the amount of excellence sufficient to justify large contributions of any one picture, be decided by the referees, and intimation conveyed by them to the contributor of such picture.

In order that the exchanges thus made may possess an educational value, in a photographic point of view, it is desirable that the rule rendering necessary a description of process, lens, aperture, light, &c., should be imperative. These particulars written on the back of the picture are apt to deface it when mounted, it is therefore resolved that such portion of the margin of the print as will be trimmed off in mounting, is the most suitable place for such information.

Hitherto the operations of the Exchange Club have been confined entirely to stereoscopic pictures. There is no reason whatever, why, under the new arrangements, the exchange of large pictures should not be as freely made. The production of stereoscopic pictures is ceasing to absorb the attention of photographers as exclusively as it once did. Many of those amateurs who tried their "'prentice hand" on stereoscopic manipulations, now aim at more ambitious results. The facilities for exchange will, we hope, encourage these efforts. The assurance that good pictures will be received in return for good pictures will induce many, we believe, to contribute. Some little care in packing will be necessary: a light roller of deal, an inch or less in diameter, is the best protection, and adds very little to the expense of transit in the book post. Nothing is more distressing than to see a good picture spoiled by folding in a letter, or other imperfect packing. It is a source of regret which we not unfrequently meet with. Correspondents send us charming views folded and cracked in a letter, and consequently ruined. Those only who reverence beautiful things can understand the exquisite sense of pain which the sight of photographic gems so maltreated causes us. In the Photographic Exchange Club, self-interest, if nothing else, will prevent careless packing, as the same packing, rollers, &c., sent by each person, will be received by him again.

Various plans have been discussed for meeting the trifling expenses contingent upon the new arrangements; and the method decided upon, we think, will satisfy all parties. It was most important to secure the gentlemen giving their services from any possible call upon their purses in such service; it was not less important that not a shadow of beneficial interest of a pecuniary kind should attach in any way to the club, or any one connected therewith. The plan of enclosing sufficient stamps to defray the expenses of postage and stationery, will, we think, meet both these positions.

As we have said, the responsibility involved in classifying the exchanges under the new arrangements, will be undertaken by three gentlemen. Some of our correspondents had suggested that we alone should undertake that duty: the position of sole umpire in such a case would be an invidious one for any individual, however thoroughly he might possess the confidence of the members. We have pleasure in stating therefore that we have secured the services of Mr. Sebastian Davis, one of the vice-presidents of the South London Photographic Society, and Mr. Frank Howard, treasurer of the same society, to act, in conjunction with ourselves, as referees. The latter gentleman will also act as secretary, and to him all pictures for exchange, and correspondence connected therewith, must be addressed.

The following are the rules to which members now desirous of joining the club are desired to conform :—

That the "Stereo Exchange Club" be reorganised under the title of the "Photographic Exchange Club," and that the object of the club be to exchange between its members, stereo, and other photographs.

That all gentlemen desirous of becoming members be requested to forward their names and addresses to the appointed secretary.

That the exchanges be made under the superintendence of three gentlemen, one of whom shall act as secretary, and the other two as referees.

That the exchanges be made monthly; all prints sent to the secretary for exchange during a given month shall be distributed during the following one.

That prints of fair average quality be alone admissible, and all inferior ones be rigorously excluded; that the exchanges will be regulated by the artistic as well as by photographic excellence, and that the decision of the referees shall be in all cases final.

It is desirable that all stereo prints be sent untrimmed and unmounted, and the right and left halves be carefully marked. Members sending mounted prints cannot be guaranteed mounted ones in return.

That members desirous of exchanging large pictures for stereo may do so; four stereographs being regarded as equivalent to a 10×8 picture, and other sizes in proportion.

That the names of the subjects, process, the lens and stop used, time of exposure and general conditions be legibly written upon a vacant margin of each photograph. Large prints should in all cases be sent on rollers, and otherwise carefully protected from injury; each roller sent will be used in returning the exchanged pictures.

To meet the necessary and incidental expenses, each set of stereoscopic prints and every communication sent to the secretary necessitating a reply, shall be accompanied with two penny postage stamps; and with each package of larger prints, stamps of a sufficient amount to cover the postage of properly packed exchanges.

That the duty of classifying the exchanges, or acting as referees, be undertaken by Messrs. Sebastian Davis, Frank Howard, and G. Wharton Simpson, and the duty of Honorary Secretary by Mr. Frank Howard, 12, Whittingham Villas, Studley Road, Stockwell, to whom all communications must be addressed.

The above regulations are to remain in force for one twelvemonth.

PHOTOGRAPHIC PORTRAITURE.*

On Likeness in Photographic Portraits.

It might be supposed that a portrait obtained by means of mechanical appliances would trace the features of the sitter literally; but such is not always the case, for many causes operate to deprive photographic portraits of that resemblance to the original, which, theoretically, they ought always to possess.

One of the most influential of these causes is, undoubtedly, too often inherent in the optical apparatus. On the one hand there is the cupidity of the photographer who strives to take his hundred or more portraits in one day "to make money;" on the other, there is the impatience of the sitter who can with great difficulty be persuaded to sit still for five seconds at a time; to meet these conditions there has been introduced into the operating-room lenses of very short focus, too short, in fact, the inevitable effect of which is to distort the face and figure in the images. It may be confidently asserted that photographic portraits can only be accurate when taken with lenses of long focus and of much larger diameter than the size of the proof is supposed generally to require. Thus it has happened that the *cartes de visite* portraits have been a kind of revelation, not only to the public, but also to a large number of operators, and their continued popularity may be well understood when their superior accuracy of likeness is taken into consideration.

Their value is best demonstrated when they are compared with the life-sized portraits affected by some operators.

Although the defect in likeness of a photographic portrait is due sometimes to the imperfection of the apparatus, want of skill and experience in the operator leads to the same result.

To assume that a likeness consists solely in the reproduction of the outlines of the model, and in the complete harmony of the several proportions constituting the whole,—is to degrade the photographic art to the rank of a purely mechanical operation. The sculptor makes his clay model, which his workmen, by means of measures and callipers, can imitate and reproduce with the most scrupulous accuracy; but this purely geometrical copy of the artist's conception lacks the last finishing touches of the hand of genius, the breath of inspiration that gives it artistic life. For, independently of the physical resemblance, there exists another, which may be termed the *moral*. It is that which by a gesture, a familiar attitude, by a certain something which is indefinable, enables us to recognise an acquaintance at a distance where the features are indistinguishable. It is this indefinable resemblance, that the photographic artist must be able to seize, and to arrive at it, he must carefully study his model, recognise the most accustomed play of countenance, and learn to appreciate everything which constitutes *individuality*. When the model is seated, or has taken the chosen attitude, usually a conventional one, it will be too late to think of his characteristic physiognomy, if it has not been carefully studied previously, or if the memory has not preserved a faithful impression of it.

Hence it is that the inartistic photographer, treating every model on a conventional system, entirely ignores or deforms the individuality of his sitter. To produce a good and faithful photographic portrait requires time and opportunity for studying the original; and this necessarily involves a greater expense than the public is willing to afford. And thus it happens that the majority of portraits are deficient in the elements of likeness that should render such works valuable.

On the Pose of the Model.—The first and most important condition of the *pose*, is to secure, during the whole sitting, the most complete and absolute immobility on the part of the sitter; for it should be well understood that the slightest movement of the body, or contraction of the visage, or the least change in expression, will render the most skilful and intelligent labours of the operator fruitless. Therefore, before everything, we must avoid giving a constrained attitude to the sitter, or one in any way difficult to maintain. Particular care must be given to the head-rest; and while securing its complete rigidity so as to afford complete immobility to the model, at the same time secure a simple, natural, graceful, and harmonious pose. Without this latter condition we can obtain neither a resemblance nor an agreeable picture; for, as already stated, a likeness is not only the exact reproduction of the features, but is also that of the *ensemble* of the whole person.

Especially must we avoid giving to our models tragic or extravagant attitudes which ignorant artists mistake for dignity, without reflecting that they suggest the idea of the model being taken while under the hands of a dentist or a lecturer upon electricity. Grace and dignity are far from being incompatible with simplicity, or even with a certain

* Continued from p. 472.

bonhommie. The head should be held level with the camera, without raising or depressing the chin too much. A portrait taken full face is only admissible for persons who are tall and thin. For all others, a three-quarter face, taken under such conditions of lighting as will be indicated hereafter, is preferable.

The eyes should be steadily directed on a fixed point, for example, on the aperture of the camera, and if it happens that the model is obliged to wink, it will immediately resume its gaze upon the point first selected. The arms should hang naturally, and without affectation, and if the artist considers it necessary to secure a particular attitude, there should always appear sufficient reason for adopting it, and in no case must the arms be allowed to project far from the body. A good disposal of the hands is, perhaps, one of the most serious difficulties the photographer, as well as the painter, has to encounter, for in this particular the artist has almost always to contend with his model. Foreshortening must be avoided; so also must the spreading out of the fingers like a fan. The stamp of elegance and distinction imparted by the hand is extremely difficult to acquire, and when it is possessed by the model is too frequently marred by affectation. Gloves generally produce a very bad effect when introduced into a photograph, and should always be avoided, if possible.

The carriage of the body also exercises a great influence upon the success of a portrait. Seldom, if ever, should the figure be taken in front, especially in the portraits of females; for this position is anything but favourable for showing the elegance of the figure. As a general rule, the body should be placed obliquely, the legs following the same inflexion, while the head should be turned in the opposite direction, showing three-fourths of the face. In no case should the legs project beyond the plane of the body, nor be crossed one over the other, nor straddling.

It is not always easy for the artist to obtain a rigorous observance of all the rules of a good pose from his model, such as have been indicated above. Every one has the pretension of fancying that he knows what attitude suits him best. The artist must not yield his better judgment to this conceit; for of what value is the appreciation or the judgment of a person who, after all, cannot judge artistically of the effect produced by his uncouth attitudes. The artist must consider only the judgment of those capable, by suitable cultivation, of estimating the artistic qualities of his works. In painting, the artist can improve upon his model's attitude if it be deficient in grace, but the photographer must never forget that his camera will copy literally the object presented to it, in all its deformity.

To overcome this perverse tendency of the model, the photographic artist must provide himself with an inexhaustible stock of patience, backed by politeness and amenity, which, however, must not exclude a certain amount of firmness derived from a consciousness of his talent. The photographer must exercise a real ascendency over his model, whom he must inspire with a certain confidence, and by a kind of magnetic influence communicate his own good humour to the physiognomy of his model. Without these conditions being fulfilled he will only obtain cold, formal, grimacing faces, which are the shame of photography, the despair of persons of taste, and the objects of a severe censure on the part of the critic and a discriminating public.

(To be continued.)

Scientific Gossip.

One of the most valuable works on chemistry, which it has been our good fortune to peruse, has just been published. It is the first part of Dr. Odling's long promised manual, which has for years been looked forward to in the hope of its proving a useful text-book for students in the unitary system of chemical notation, a system which is rapidly taking the place of the ordinary method of notation, but which has not hitherto had a worthy English exponent. The work before us in no way falls short of the expectation formed of it; indeed, from the great clearness and systematic manner in which every subject is arranged under appropriate heads, it would be difficult to find a book which is at the same time capable of affording such valuable information, at once to the youngest beginner, and to the experienced chemist. Those of our readers who possess a knowledge of general chemistry, as well as an acquaintance with the photographic branch of the science, will derive considerable information from a perusal of this volume; but as it is not to be expected that the majority of our readers are sufficiently good chemists to care about fathoming the mysteries expounded in Dr. Odling's volume, we will lay before them a few extracts referring to subjects of special interest to photographers, from which the exhaustive and masterly manner in which the different topics are discussed will be evident. Speaking of that very necessary body, water, we have the following complete account of its purification and properties from natural sources:—Water is not met with naturally in a state of absolute purity, but that produced by melting fresh water ice is often uncontaminated, save with minute traces of ammonia and carbonic acid. Pure water is obtained by distillation. The portion that first comes over should be rejected as liable to contain volatile impurities; a residual portion should not be driven over from the still, while the intermediate portion only should be collected for use. For special experiments, where absolute purity is required, this water should be twice redistilled: first with phosphoric acid, to hold back any volatile alkali; and then with hydrate of potassium or caustic lime to hold back any volatile acid.

Rain water collected in the neighbourhood of large towns, generally contains in addition to nitrate and carbonate of ammonium, sulphate of ammonium, organic and carbonaceous matters, and, it is said, traces of fixed alkaline chlorides, derived from the combustion of fuel going on within the town. Even in country districts, the first rain that falls after a drought, is contaminated with nitrate and carbonate of ammonium, and with organic matter; but the water of later rains is almost free from impurity. *River water* consists principally of rain water, which having fallen in more elevated districts, has gradually drained over and through the soil into lower districts, whence it travels downwards to the sea. The characters of river water are very variable, and depend chiefly upon the nature of the drainage area from which the river is supplied. Thames water, which is collected for the most part from an alluvial soil, contains about 18 grains of dissolved matter in a gallon, two-thirds of which consists of carbonate of calcium; the next most important constituent being sulphate of calcium and chloride of sodium. The Dee, of Aberdeen, which drains a granite district, contains in a gallon about 3 grains only of saline matter, consisting principally of carbonate of calcium, but also yielding marked quantities of potash salts, derived from the felspar of the granite. The Swansea rivers again, which drain a carboniferous district, abounding in pyrites, contain 3 grains and upwards per gallon of saline matter, consisting principally of sulphate of calcium. River water in the neighbourhood of towns is usually contaminated with sewage products from the artificial drainage of the towns. *Spring water* is derived from rain water, which having percolated the earth to a greater or less depth, is by natural or artificial means again brought to the surface. As a general rule, spring water contains a greater amount of dissolved matter than river water, on account of the greater quantity of earth that has been exposed to its solvent action. Spring water, also known as pump or well water, varies in composition, according to the nature of the strata from which it is obtained. *Lake water* corresponds in its characters with the river water of similar districts; lakes indeed being frequently mere expansions of, or reservoirs attached to, adjoining rivers. The supply, like that of river water, is derived chiefly from surface drainage, sometimes also from springs. Lakes are for the most part found in mountainous districts of the older formations, and the water of such lakes is very free from saline contamination. The Loch Katrine water, now supplied to Glasgow, contains only about 2½ grains of saline matter in a gallon. Domestic waters, whether obtained from rivers, springs, or lakes, are spoken of as hard or soft, according to the degree in which they possess the property of curdling soap. This curdling depends upon the formation of an insoluble compound by the union of the fatty acids of the soap with the lime or magnesia of the hard waters. The hardness, dependent upon the presence of sulphate of calcium, may be removed by the addition of carbonate of sodium to water; while that, dependent upon the presence of acid carbonate of calcium, may be removed by boiling, or by the addition of lime water. Either one of these processes effects a separation of the dissolved lime salt by precipitating neutral carbonate of lime *Sea water* has altogether a very uniform composition, although, indeed, the amounts of saline matter, yielded by different seas, are not precisely the same. Sea water has a specific gravity of about 1027, and contains, on the average, some 2,500 grains of dissolved matter in a gallon, including about 1,900 grains of common salt, and 400 grains of chloride and sulphate of magnesium. The quantity of salts in sea water is continually increasing; for the pure water, always evaporating or distilling from the sea, supplies the rain-fall of the earth's surface, and this, after scouring the soil over, or through which it flows, returns to the sea in the form of rivers charged with saline impurity. Hence the sea becomes the recipient of all soluble matters washed from the earth's crust. *Mineral waters* contain either some unusual constituent of water, or a great excess of some ordinary constituent. The principal varieties of mineral waters are the chalybeate or ferruginous, the sulphurretted or hepatic, and the saline.

Upon referring to that portion of the work which treats of the sulphur acids, we meet with the hyposulphites under a new name, *thiosulphates*. Hyposulphite of soda, which is here termed thiosulphate of sodium, is mentioned as follows:—The alkaline thiosulphates dissolve the halogen of salts of silver, forming double salts of a remarkable sweet taste, thus:—

$$Ag\,Cl + Na_2\,S_2\,O_3 = Na\,Cl + Ag\,Na\,S_2\,O_3$$

The thiosulphates or hyposulphites are much used for fixing photographic pictures, the thiosulphate of sodium being usually selected for the purpose. The photographic paper, or glass, uniformly coated with some silver compound, is exposed in the camera or press, and then immersed in a solution of the thiosulphate, which dissolves the silver away from those parts of the picture which have not been acted upon by light, and converts the silver compound that has been acted upon into unalterable sulphide of silver. This last statement is certainly very different from what is usually considered to be the fixing action, by our leading photographic chemists, of hyposulphite of soda.

It would be interesting to know the train of reasoning which led Dr. Odling to this conclusion. The theory of the action is described plainly enough, but we suspect that the experiments which should precede the theory were not such as would pass unchallenged in the laboratories of chemists who were at the same time experienced photographers.

A correspondent, W. M., has forwarded to us four pieces of glass for examination in the spectroscope. We append the results: No. 1 is of a light yellow colour, and allows both green and blue light to pass as well as yellow and red; it is, therefore, unsuitable for photographic purposes. No. 2 is somewhat darker than No. 1; it would be of no use in case bromide of silver were used, although it might be available for iodide of silver. No. 3 is an excellent glass, in fact, it is almost too good, as, along with the actinic rays, it cuts off a great quantity of light, which is useful for illuminating purposes. No. 4 is a light-coloured glass, nearly of the same degree of intensity as No. 2; it, however, possesses in a high degree that property of false dispersion to which we recently drew attention. In the spectroscope it is seen to cut off very perfectly all the rays more refrangible than *b*, and is, therefore, well adapted for employment in photographic laboratories.

INSTANTANEOUS PHOTOGRAPHY.

BY SAMUEL FRY.

Under the above heading it is proposed to describe the methods which I have employed to secure photographs of marine and atmospheric subjects, objects in motion, &c. I may premise there this will probably be found no invention of striking novelty, nothing calculated to effect a revolution in photography, but rather an accumulation into one complete system of manipulation, of a number of details, which though in the main already in the possession of photographers, have not in their entirety been hitherto recognised as constituting a reliable process. Some time since, I had occasion to publish in the columns of this paper, the process I had up to that time mostly employed, but though a great amount of success attended its practice, I found on commencing a series of experiments on the best means of obtaining maximum sensibility, during the early months of this year, that a fresh channel was open to me, from the improvements effected during the time which had elapsed since the conclusion of my earlier practice. I shall make a point of avoiding, as far as possible, any digression into mere experimental processes, even though such possess their share of interest for a large class. I shall simply describe in detail the arrangements I made to secure the highest sensibility, and at the same time obtain powerful and vigorous negatives. These pictures were for a commercial speculation, and therefore from the high standard to which such pictures have attained, and their being intended for printing transparencies, it was indispensable that the negatives should be absolutely faultless, so that the problem was to combine extreme sensibility with every quality that a fine negative should possess, vigour, half tone, atmosphere, perfect immunity from any, and all photographic shortcomings and bedevilments. It is commonly received as an axiom amongst photographers, that in proportion as the sensitiveness of the medium is increased, so also is the liability to irregularity of action, from the delicate balance being so easily disturbed, and without a doubt this idea is to some considerable extent justly founded. But I cannot but take this opportunity to say that I believe too much stress has been laid on it, and that amateurs have been deterred from attempting to produce instantaneous pictures from erroneous opinions respecting the difficulties to be encountered. But it will be worse than useless for any one to attempt rapid photography, unless he have previously acquired a very considerable manipulatory skill in ordinary collodion photography, as well as the gift of quick carrying out of the needful preparations.

It will be remarked that one great principle that I have held in view, has been to combine with complete efficiency of apparatus, as much portability as was consistent with the amount of work to be done. Another peculiarity is the method of simply developing the picture with iron whilst in the field, placing in a plate box, and fixing and intensifying at home, which need not be done until any convenient time. I describe this now in order to avoid any break in the continuity of the article on Development, Choice of Subject, &c. The camera which I had constructed for this purpose was fitted with a pair of double-combination stereoscopic lenses, and having a removable front, one of Mr. Dallmeyer's triplets could be adjusted; the latter lens covers a plate 7¼ by 4½, and includes about 65°. This form of picture is extremely pleasing, both from the large angle obtained and from its shape, which is admirably suited for sea and clouds, and for country landscape with hilly or wooded backgrounds. The exposure with this lens is, during summer weather, very nearly instantaneous; and with it may be seccued good cloud and general atmospheric effects, which many prefer to stereoscopic pictures. The range of focus of the camera is from 3 inches to $7\frac{1}{2}$, thus allowing full range for both lenses.

For developing out of doors, I had a box constructed 18 inches long, 13 high, and 13 wide, which held all my things—apparatus, chemicals, &c. &c.—and was so constructed that "when the door was opened" the contents were fully exposed to view without falling out, thus greatly facilitating its passage through a foreign custom house. It has been usual in all such contrivances that I have heard of, to inspect the development through a yellow glass, but for that I substituted a mask of gutta percha, edged with velvet, made to fit round the nose and forehead; this answered admirably, and I was able to develop out of doors with all the comfort of a laboratory.

The collodion I recommend is a thin bromo-iodized sample, which should have been mixed some considerable time, my own had, I believe, been iodized for many months. The results of using such a collodion are (begging Mr. Sutton's pardon for differing so widely from him), very exalted sensitiveness, great freedom from spots or blemishes, in consequence of the mixture having so thoroughly settled, and a certainty of the collodion being always in the same condition, which under the old system of using newly iodized collodion was very difficult to ensure. The silver I recommend for making the bath would be re-crystallised, at five shillings per ounce, this is dissolved 40 grains to the oz. of water, iodized as usual with about 3 grains of iodide of potassium for each pint of solution, filtered carefully, and then oxide of silver added to the clear solution, and agitated well at intervals for several hours. This effectually removes every trace of organic matter, and leaves the bath generally with an alkaline reaction, so that a fogged picture would result; but to prevent this I add to each quart one minim of strong nitric acid, and the immediate result of a trial of the bath will prove that (other conditions being right), the bath will yield, with rapid exposure, clean brilliant vigorous negatives, which give at the first operation of iron development, sufficient vigour to require but slight after intensifying. I strongly deprecate the system of adding ether or alcohol to a new bath, as it soon acquires more than enough, which sometimes causes markings on the plates.

The developer I recommend is 10 grains of iron, 30 minims of Beaufoy's acid, to an ounce of common water, the use of distilled water is an unnecessary complication, involving often much trouble, and answering no good purpose whatever. The only purpose in ordinary photography for which distilled water is required is the collodion bath, and for that it is not indispensable.

Critical Notices.

TURNER'S LIBER STUDIORUM. By Messrs. Cundall and Downes, Bond Street.

This is a series of reproductions from Turner's well known studies. The negatives were produced by Mr. Thurston Thompson from the original drawings in the museum at South Kensington. We may regard the publication of this series by the firm mentioned above, as the first-fruits of the protest made by ourselves and our contemporaries against the photographic monopoly at South Kensington. The printing and publication of this series was, instead of being produced at the museum, opened to public tender. Messrs. Cundall and Downes secured the contract, and have issued the work in a style of such excellence, and at a price so moderate, as to deserve the gratitude at once of artists, photographers, and connoisseurs; of all, indeed, interested in the possession of studies of such interest and value.

The number of drawings here included is thirty, the whole at the present time in the museum. If we remember rightly the total number included in the "Liber Studiorum" was considerably greater, if not double the number. The series before us constitutes, however, a very complete system of studies. The original drawings being in monochrome, chiefly sepia, the photographs which are exactly the same size, are absolutely perfect as fac-similes, and possess a value in this respect which infinitely transcends that of the best engravings of the same subjects. The printing has been conducted with great care and taste, so as to reproduce the exact tint of the originals.

Whatever may be said about the art claims of other applications of photography, here, at least, the most exclusive and jealous guardian of the recognized arts cannot gainsay the pre-eminence of photography. Not merely the drawing in its most literal accuracy, but the very touch of the master is reproduced with an unerring fidelity which the ablest copyist might in vain strive after with either pencil or graver. If not a fine art itself, it can reproduce and multiply works of fine art after a fashion, which it may defy the oldest and best of its challengers to equal or excel.

The value of Turner's "Liber Studiorum," as a series of studies, can scarcely be overestimated. Each picture is a masterpiece of composition and chiaroscuro, which landscape photographers would do well to study and emulate; and as each picture is, we believe, a study from nature, the subjects presented are entirely within the scope of photography to produce, most art students are already familiar with the value of such studies from the pencil of the greatest landscape painter of modern times, and will doubtless gladly avail themselves of the opportunity of possessing such perfect fac similes. They are of equal, if not of greater value to photographers, to whom we would earnestly recommend their appreciative study.

INSTANTANEOUS VIEWS OF PARIS. London: The Stereoscopic Company.

This is a second series of instantaneous street views of Paris, issued by the Stereoscopic Company. Excellent as were their former series, the present, in many respects, surpasses it. The most crowded thoroughfares of lively Paris are here most exquisitely rendered, with a perfection of definition and detail perfectly marvellous. Walking figures. running figures, falling figures, equestrian figures and vehicles, all caught in their acts without the slightest appearance of movement or imperfect definition. Here is a lad transfixed in the act of falling, flying forward, as something has tripped him up; he remains on the slide doomed neither to fall further nor rise again. Here we have unimpeachable evidence that two well-dressed Parisians were seen walking down the Boulevard Montmartre actually out of step, the right leg of the one and the left leg of the other being uplifted at the same moment. The majority of these pictures are entirely free from every trace of under exposure, and are brilliant, clear, sharp, bold, and delicate, some of them also possessing fine natural skies. They are also remarkably clean and free from blemish or manipulatory faults, furnishing fine examples altogether of what instantaneous pictures ought to be. Of the interest of the scenes it is unnecessary to speak. Life in Paris is almost a synonyme for all that is brilliant and gay, and these views are chosen from the busiest scenes of the gay metropolis.

INSTANTANEOUS SEA VIEWS. By J. Symonds, Ryde.

We cannot speak so highly of the pictures before us as of those we have just noticed. Whilst marine views present fewer difficulties than street scenes, the photography here is far inferior in quality. Many of these views on the solent are full of interest as far as the subjects are concerned, are also perfectly instantaneous and thoroughly well defined; there is a lack of brilliancy in some, and an absense of cleanness in others, which indicate either want of care or want of skill in the manipulator. These considerations apart, many of the pictures are well chosen and interesting photographs. One very fine and artistic picture entitled "Down by the sea is vignetted." This adds much to its charm as a picture, but militates against its effect as a stereograph. Stereoscopic pictures are intended to be actual presentments of nature as seen, sufficiently so to present an illusion to the eyes: this, of course, could never be the case with a vignetted picture, which in the stereoscope produces a most unsatisfactory effect. The view is, however, sufficiently fine as a picture to induce us to remove one-half fron its card and place it on another and larger mount. The chief thing Mr. Symonds, or his operator, has to study is greater care and cleanliuess, and to acquire a little more brilliancy in the negatives.

THE TOWER OF LONDON. By Dages and Harman, A. Gaudin, Sermon Lane, St. Paul's.

We have before seen isolated views of the Tower; but never until now an entire series, giving a complete view of this monument of old London. It is not too much to say that there is no building so fraught with historical associations of nterest as this old prison, slaughter-house, and tomb of so many nobles by birth or intellect, and the victims alike, whatever their merits, of a similar bloody fate. The ghosts of accomplished Raleigh, gentle Lady Jane Grey, ill-fated Mary, "false, fleeting, perjured Clarence," fair Anne Boleyn, and a troop of the other victims of her ruthless lord, who "spared no man in his anger, or woman in his lust," seem to flit by as we gaze in succession on the "Bloody Tower," the "Bowyer Tower," the "White Tower," the "Traitor's Tower," the "Constable Tower," the "Beauchamp Tower," and others, each marked by some dark memory. What a chapter on the virtues of kings is here suggested! We turn from these reflections to one more pleasant—the excellence of many of these pictures. Some are a little hard, but as a whole they are clean, brilliant photographs. Here is one which will possess historic value, a group of warders, or "beef-eaters," as they are known in common parlance, in the old historic dress, which has been, we believe, recently condemned, to be numbered amongst the things of the past. The series, which numbers between two aud three dozen, will, we apprehend, be in demand as a source of instruction as well as amusement. We may add, in answer to some inquiries, that these, as well as former series by the same artists, are published by A. Gaudin.

STEREOGRAPHIC VIEWS IN ITALY AND THE PYRENEES. By William Bircham, jun.

We have received from Mr. Bircham a dozen stereographs of scenery in Italy and in the Pyrenees, which far surpass the average of amateur photography. The views are well chosen, every gradation from the bold foreground, to the delicate mountainous distance, twelve or twenty miles off, is perfectly rendered, and added to this, in many instances, a fine sky, with delicate natural clouds. Most of the negatives appear to have been taken instantaneously, both clouds and running water preserving all their own characteristics, the clouds delicate and fleecy, the water transparent and in motion. Amongst those which especially please us are the "Tower of the Black Prince," "The Bay of Naples," the "Entrance to the Valley of Luz, from Argeles," and the "Marina and the Porta Felice, Palermo," all of which are decided gems of photographic scenery.

ON THE PHOTOGRAPHIC ACTION OF COLOUR.

BY J. CLARKE.*

The subject of the present paper is on the photogenic action of colour; a paper under the same title was read by me at the first meeting of the last session, but it would appear that the experiments there set forth were not entered into so minutely as could have been desired. Since then I have conducted further experiments in the same direction, and I now propose laying the result before this society, having promised to do so in a letter to our secretary (Mr. Wall), and which was read by him at the meeting following.

This paper will comprise a series of experiments on the photogenic action of colour on differently iodised collodions. The collodion used is that sold by Messrs. Horne and Thornthwaite, three separate ounces of which were iodised in the following manner, viz.:—

Collodion No. 1 with 4 grains of iodide potassium.
" No. 2 with 2 grains of iodide potassium.
and 2 grains of bromide potassium.
" No. 3 with 4 grains of bromide potassium.*

Now, as in my last experiments no attention was paid to the colouring matter employed, I hope in this to fully compensate for the deficiency, as every care has been taken to obtain the colouring substances in the greatest purity; the which, and the manner of employing them I shall now attempt to describe. A square of card-board was coloured with different bands in the following order, viz.:—1. Gamboge; 2. Yellow chrome; 3. Naples yellow; 4. Red chrome; 5. Vermilion; 6. Carmine; 7. Cobalt blue; 8. Ultramarine; and 9. Indigo. This was fixed against a wall, aud a photograph taken of it with plates prepared with each of the above collodions, sensitized in a 40-grain nitrate of silver bath, with an exposure of one minute each; the result of which will be seen in the following table:—

	Collodion No. 1.	Collodion No. 2.	Collodion No. 3.
1. Gamboge - - -	No action	No action	No action
2. Yellow chrome - -	No action	No action	No action
3. Naples yellow - -	Medium	Medium	Medium
4. Red chrome - - -	No action	No action	No action
5. Vermilion - - -	No action	No action	No action
6. Carmine - - - -	Slight	Slight	Slight
7. Cobalt blue - - -	Action strong	but not equal	to white
8. Ultramarine - - -	Action some-	what less than	cobalt
9. Indigo - - - - -	Slight	Slight	Slight

Thus it will be seen there is no difference perceptible in the action of each of these collodious; not that I conclude from this there is no real differeuce between the action of a bromide and an iodide, but I think it establishes the fact that there may be other causes to influence the action of colour than the presence or absence of a bromide in the collodion. Under some circumstances, however, the presence of a bromide may make an important difference in the resulting picture, but I do not think the action of colour would make any particular difference in the result; that is to say, I believe the action of any colour on the bromide of silver would differ little or nothing from the action of the same colour on the iodide of silver; of course these remarks only apply to the use of a bromide in a wet state, *i.e.* in collodion; but whether the same result would take place if silver plates were exposed to the vapours of iodine and bromine, and then submitted to the action of various collodions, I cannot say. In concluding these remarks, one or two thoughts suggest themselves; first, that objects in which the colours yellow and red predominate will have but little action on the sensitive film; at times, however, this is subject to a little modification, for instance, the action of some very bright reds is at times very great; the reason of this, at present, is not well understood, although it has frequently been observed by many experimentalists. The theory which I would advance in explanation, is, that possibly certain of these red colours possess the property of reflecting more of the non-visible actinic rays of the spectrum than other colours; this of course, remains to be proved.

The action of Naples yellow, marked No. 3 in the list, is somewhat great; but it is such a pale yellow, and reflects a considerable quantity of white light, therefore its actinic power is not so much to be wondered at; perhaps the selection of this colour was somewhat unfortunate, as I have never found any decidedly yellow colour give any marked action. The action of the blues are pretty uniform; the lighter the blue the greater the action invariably.

I have not touched on the action of any of the compound colours, as full justice could not be done in a short paper like the present; if, however, your committee should think fit to ask it of me, I shall be happy to conduct further experiments in that direction, as no doubt important modifications would accrue from the mixture of one colour with another.

British Association for the Advancement of Science.

BINOCULAR LUSTRE.

Sir David Brewster read a paper "On Binocular Lustre." He commenced by stating that some years ago it was observed by Professor Dove that when the right and left eye figures of a

* Read at the meeting of the South London Photographic Society, October 10.

* It is important to call the attention of the reader to the discussion on this paper in another column, from which it will be seen that there is reason to believe some error had been made in the experiments.

pyramid, or other mathematical solid, the one drawn on a white, and the other on a dark ground, were inserted in the stereoscope, the solid in relief appeared with a particular lustre. Professor Dove described the lustre as metallic, and in another place, where he described the diagrams as drawn with white lines on a black ground, and with black lines on a white ground, he stated that the pyramid in relief "appears lustrous as made of cyraphite." Other observers described the lustres differently some as resembling ground-glass, and others as like paper darkened with a black-lead pencil, while Professor Wood regarded it as "recalling the idea of highly polished glass." In order to explain this phenomena, Professor Dove remarked "that in every case where a surface appeared lustrous, there was always a transparent, or transparent-reflecting, stratum of much intensity, through which we see another body. It is therefore externally reflected light in combination with internally reflected or dispersed light, whose combined action produced the idea of lustre. This effect," he elsewhere added, "we see produced when many watch glasses are laid in a heap, or when a plate of transparent mica or talc, when heated red hot, is separated into multitudes of thin layers, each of which, of inconceivable thinness, is found to be highly transparent, while the entire plate assumes the lustre of a plate of silver." To these examples of lustre, produced by these plates, not in optical contact, or if in actual contact, having different reflective powers, were to be added the following: pearls, mother-of-pearl, pearl spar, and composite crystals of calcareous spar, and decomposed glass of all colours. The cause of these various kinds of lustre, and of that of metals, had always been well known, and when binocular lustre attracted the attention of philosophers, it was natural to ascribe it to the same cause. Professor Dove did this, and considered the dark surface in the one picture as the dispersed light, and the white surface as the regularly reflected light, the dark surface being seen through the white surface. This theory of binocular lustre, he had reason to believe, was not satisfactory. The phenomena was first observed by himself in 1843, under conditions of different forms than those under which it was subsequently seen in the stereoscope. Having adverted to a paper "On the Knowledge of Distance given by Binocular Vision," published by himself, in 1844, in the "Edinburgh Transactions," he said, that with his knowledge of the phenomena he could not adopt Professor Dove's explanation of the lustre seen in the stereoscope by the union of figures on dark and white, or differently-coloured surfaces. In order to test this explanation by other means, he combined faces that had no geometrical figures upon them, and he found that binocular lustre was not produced. This experiment seemed decisive of the question. He was led to infer from it that the lustre observed in the combination of right and left eye figures of solids, was not due to the rays from a dark surface passing through a lighter one to the eye, but to the effect of the eyes in combining the two stereoscopic figures, and to the dazzle occasioned by the alternating intensities of the two combined tints the impression of one of the tints sometimes disappearing and re-appearing. He referred to an article published by Professor Road, of Troy, on his (Sir David Brewster's) "Theory of Lustre," and which he disavowed, not having adopted any "theory of lustre." He had merely started an objection to Professor Dove's theory of binocular lustre, and an opinion regarding its cause; and as the simple experiment on which he founded that opinion had been made by others with a different result, he thought it right to re-examine the subject with the assistance of other ties than his own, and had obtained results which might be of use to those who were disposed to study the subject more elaborately. Binocular lustre was a species of lustre *sui generis*. It was a *physiological*, not a *physical* phenomenon, and had no relation whatever to those varieties of lustre which arose from the combination of lights reflected from the outer and inner services of luminated transparent, or translucent bodies. He assigned various causes for the physiological character of the phenomenon, and then added, "If binocular lustre arises from a physiological and not from a physical cause, we must look for this cause in the operations which take place in the eyes of the observer when binocular lustre is distinctly seen. These operations are of two kinds. First, in combining geometrical or other figures to represent solids whose parts are at different distances from the eye, the optic axes are in constant play, not only in varying the distance of their focus of conveyance, to unite similar points at different distances on the two diagrams, but in maintaining the unity of the picture by rapidly viewing every point of its surface. Secondly, when the two surfaces have different shades or colours, the retina of one eye is constantly losing and recovering the vision of one of them. Each optic nerve is conveying to the brain the sensations of a different tint or colour. The brain is therefore agitated sometimes with one of these sensations, and sometimes with the other, and sometimes with both of them combined; and it is, therefore, not an unreasonable conclusion that, in the dazzle produced by this struggle of flickering sensations, something like lustre may be produced. In studying the subject of lustre there are some facts deserving of attention. In a daguerreotype, for example, of two figures in black bronze, with a high metallic lustre, it is impossible, by looking at either of the pictures, to tell the materials of which they are made. No lustre is visible; but when the two equally shaded pictures are combined in the stereoscope, the lustre and true character of the material are instantly seen. Another instructive example is seen in the stereoscopic representations of a boy blowing a soap bubble. The lustre of the watery sphere is not visible in either of the two pictures, but when they are combined it is distinctly seen. In both these cases, and others of the same kind, tints of similar intensity are combined, and there is no ground for assuming that the two different surfaces combined appear at different distances, and that the one is seen through the other, as in Professor Dove's theory.

Mr. Cornelius Varley, of London, remarked that the mind could not attend to two things at once. Now, in the stereoscope, the eyes were forced to see two things, and whenever lustre was produced it was a species of dazzling which rendered the eye unsteady, and the mind was forced to see white and black alternately and unwillingly. Mr. Varley added that the first artist who attempted to teach his brother artists how to produce lustre was Hogarth.

In answer to a question, Sir David Brewster stated that he was not able to say that the instantaneous appearance of a solid could be obtained by the educated eye, after seeing the solid with both eyes, if one eye were shut the observer continued to see the solid for a certain time.

Proceedings of Societies.

South London Photographic Society.

The first meeting of this society, after the summer recess, was held in St. Peter's School, Walworth Road, on the evening of Thursday, October 10th. Sebastian Davis, Esq., one of the vice-presidents, in the chair.

The minutes of the preceding meeting having been read and confirmed:

The Chairman said: Gentlemen, In consequence of the absence of our president, I am unexpectedly called upon to make a few preliminary observations introductory to the proceedings of the session. We are re-assembled together for the purpose of exercising our thoughts, and communicating our experience, in connection with theoretical and practical photography. Although we are unable to boast of any remarkable or revolutionary modifications in our methods of proceeding, as having been devised during the recess, yet recent photographs bespeak a steady and general advance towards perfection. It will be within the recollection of our members, that the capabilities of light delineations as an artistic power constituted a prominent object of interest at the conclusion of the last session. Although this question was more immediately brought under our notice by the classification originally intended by Her Majesty's Commissioners for the 1862 Exhibition, yet we rejoice to find that its general consideration has not been devoid of direct and indirect interest. The classification finally adopted by the authorities, viz., that of giving a distinct department to photography in the forthcoming Exhibition, although not entirely realizing our hopes, is yet far more satisfactory than the original one. The fact is, that whilst upon the one hand we maintain that photography does afford to the artist the means of giving expression to his conceptions of the beautiful, we yet by no means desire to ignore the fact of the greater intimacy existing between the results of the scientific means used for their production, than the corresponding relationship between the materials employed, and the finished works of the painter or sculptor. Photography is as undoubtedly the offspring of science, as its higher productions are assuredly works of art. Instead of this intimate relationship affording an occasion of regret, it constitutes to my own mind a special and decided charm. Quite sure am I that if this relationship did not exist, photography would never have acquired that world-wide consideration that it at present commands. The man of science pursues photography, and in his endeavour to extend its capabilities, or to devise increased facilities for its successful exercise, is compelled to estimate his success by an art standard; the artist who employs photography as a medium for the expression of his thoughts, is compelled to depend for assistance and progress upon the researches of the man of science. This mutual dependence has the direct advantage of creating in the scientific mind a practical acquaintance with the detailed glories of Art, and of compelling the artistic capacity to familiarize itself somewhat with the innate poetry of science. That such mutual advantages have been prominently developed by the consideration of the theme in association with the Great Exhibition classification, prevents, I think, any regret at the occurrence of the discussion. The above observations naturally lead to a few remarks upon the future of photography, and more especially with reference to the proceedings of the South London Society. If we were called upon to express briefly an object that more than any other presses upon our immediate attention, it would be that of instantaneous photography. At the present time we may assert that the science affords every facility for the correct delineation of every kind of stationary object, either by the aid of the wet, or approved dry-plate processes. Instantaneous photography affords an excellent illustration of the present intimate association between the two leading features of our study to which I have referred. The great existing inpediment to the production of artistic pictures, arises from the comparative inability of obtaining sufficiently sensitive surfaces, and quick acting lenses to register moving scenes. How oftentimes do we ardently wish to record the momentary position of a passing event, a moving shadow, or an erratic cloud. What photographer has not felt an inward longing to depict the glorious medly of foreground foliage, or the momentary appearance of a distant view as seen between the interstices of some waving branches. It is true that the pictorial registration of colour may never be fixed by its own reflection, but we have no reason to doubt that the day may be not far distant when the moving scenes to which I have referred may be permanently delineated. There assuredly exists no greater barrier to the perfection of our results in a pictorial character than the blemishes which arise from our inability to correctly represent the moving objects of nature's scenes. I here, therefore, notice that a fair and promising field of investigation is at the present moment opened up to our scientific friends composing our experimental committee. They are hence presented with a labour that not only promises to yield an abundance of the pleasurable excitement incident to well conducted experimental researches, but one which, if it fail of its immediate object, will nevertheless be attended with many collateral advantages. If we can succeed in obtaining permanent records of passing scenes under ordinary circumstances of light, in inland situations, and with correct gradations of light and shade, we should give to our works a special beauty, that would successfully enable them to vie with those possessing the glorious charm of colour. I express a wish that our united labours of the session may contribute to the realization of our hopes, so that ere long photography may be capable of registering permanently every kind of form as momentarily delineated by the visual lens upon the sensitive tablet of the human eye.

Mr. C. Jabez Hughes then read a paper on "The International Exhibition of 1862: what are the arrangements made for representing Photography there?" (See page 485, in our last.)

Mr. Howard said, notwithstanding that he had in common, he presumed, with all present, given some attention to this subject, the unsatisfactory position in which photography stood in relation to the Exhibition, had never before been brought so forcibly to his mind. The proposal made to the parent society not having been accepted, he presumed the Commissioners would adhere to their first intention, and place photography in the mechanical department, amongst all kinds of manufactures. He presumed, also, that the period for making all applications for space having now expired, the only alternative that appeared to present itself as having the least chance of bettering their position would be by memorializing Her Majesty's Commissioners. Perhaps it was a matter in which professional photographers were more deeply concerned than amateurs, and any action should be taken by them. It seemed to him that if a sufficiently influential memorial were now forwarded to the Commissioners, they might be disposed to place the further management of the photographic department in the hands of a select body of gentlemen who might do it justice. Personally, he should be glad to aid any project which might be likely to improve the position of photography in the Exhibition.

Mr. Wall scarcely agreed with Mr. Howard that professional photographers should feel more interest in the question than amateurs. It unfortunately happened that the interest of professionals, in the matter, was often limited to £ s. d. This was not true of amateurs, whose exertions were rather governed by a genuine love of the art, and from their interest and effort he thought most was to be hoped.

Mr. Howard explained that he had only referred to the greater facilities which professional photographers possessed for contributing largely. Amateur photographers rarely possessed such a number of good negatives as professionals necessarily did.

Mr. G. Wharton Simpson wished to point out an error into which he conceived both Mr. Hughes and Mr. Howard had fallen, in stating that photography was to be thrust back into the purely mechanical companionship in which at first it appeared likely to be placed. He believed he had authority for stating that it was the intention of her Majesty's Commissioners to adhere to their decision as to a separate department for photography. That he believed was a decided point. The time had also expired in which applications for space could be made. The question now for consideration was, how to make the best of the separate department, and of the space already applied for, so as to secure for British photography a worthy representation. Had the parent society seen right to appoint a committee to take the direction of that department of the exhibition, the arrangements would probably have been such as would have satisfied photographers; but that opportunity was, unfortunately, passed. They, as a society, had approved of the protest which the parent society had made against what they conceived to be a degrading classification; but he did not believe one gentleman present had ever conceived the notion of absolutely declining to appoint a committee. If they could not entirely control, it would surely have been better to have availed themselves of the power in some measure to direct. At their last meeting he had the pleasure of moving a resolution approving of the steps taken by the parent society to obtain a better classification. Those gentlemen who remembered the terms of that resolution would recollect, that in it was an express clause, implying the possibility of having to accept the offer of a separate department, and suggesting that its acceptance be accompanied with a protest against being catalogued in the mechanical position. There was one consideration which perhaps they had somewhat overlooked in the first keenness of their mortification and annoyance at the humiliating classification in which they were placed. They regarded this classification as an affront passed on their art by the Commissioners. But the truth was, the Commissioners were not established as a tribunal to decide the position of photography. They merely accepted things as they found them. The recognized authorities in these matters—the Royal Academy for instance—did not admit photography to be a fine art. It was no part of the duty of her Majesty's Commissioners, therefore, to affirm that it was so. They did what was, perhaps, the most they could do; they said in effect to photographers, "Your position is as yet undefined; we will give you a separate department in which to prove your legitimate claims." Here then the challenge was thrown down to them; it was their duty to do their best and await the world's verdict. What they now required was a fair field: an assurance that their productions would receive justice in the separate department. They required the publication of such conditions as would stimulate photographers to do their very best with the space which would be allotted to them. So far as the matter stood, he had reason to believe all the arrangements were entrusted to one gentleman. He conceived the duties were too onerous, and the responsibility too great, for any one person, however able, to undertake, with comfort or satisfaction to himself, or photographers generally. Her Majesty's Commissioners were not in a position, however, to make further overtures, and it had been resolved therefore to ask this meeting to memorialize them, pointing out the immense importance of having a body of gentlemen, known and trusted by photographers, whose interest in the art would make them willingly undertake to cooperate with the Commissioners or the gentleman they had appointed, in securing the best possible management of the photographic department, and offering, if necessary, the aid of the society in carrying out such arrangements. With these views he had pleasure in moving that a memorial, which he would read (see p. 488 in our last), be presented by the South London Society to the Commissioners.

Mr. Howard was glad to learn that photography was still to have a separate department, where they could stand on their own merits. He had pleasure in seconding the adoption of the memorial just read.

The Chairman felt assured that every one present must feel the importance of having the management in proper hands. Nothing would be more lamentable than to see the walls covered with inferior pictures to the exclusion of good ones, a thing which by bad management might easily occur. He trusted that even now, by the appointment of a competent body of gentlemen, British photography might be able to maintain a creditable position.

The resolution for forwarding the memorial was then put to the meeting and carried unanimously.

Mr. Hughes expressed the pleasure and approbation he felt that such a memorial had been agreed to, and he thought that the society had been earning the gratitude of photographers generally in taking such a step. It was quite clear that somebody must move in such a matter. The thing could not be allowed to rest where it was without some effort. It was of the utmost importance that the Commissioners should be made aware of the views and feelings of photographers on the subject, and he trusted that other societies, now that the ice was broken, would also take action in the matter. Without some steps were taken, he saw nothing for the photographic contributions but to be handed over to the sappers and miners, of whose great photographic exploits at South Kensington, they heard so much. If they heard that the photographs, with an unlimited allowance of nails and red tape, were handed over to these sappers and miners to be tied up, who could they blame but themselves, if they had not taken steps to prevent such an issue? The Commissioners might very properly answer any protestation which might be made, when the thing was done, by informing photographers that they have done nothing but find fault, without making any effort to aid them. He was delighted to hear they were to have a separate department, and thought the Commissioners had, perhaps, done the most fair thing possible, under the circumstances, in thus affording an opportunity for photographers to prove their claims.

Mr. T. Clarke then read a paper on "The Photogenic Action of Colour." See p. 496.

The Chairman asked Mr. Clarke if he had rightly understood him that he had used for one of his experiments collodion containing bromide of potassium, in the proportion of 4 grains to the ounce, as that proportion was not soluble in alcohol of anything like the strength, say 60 over proof, generally used for collodion. Unless the alcohol was much diluted by absorbing moisture from the atmosphere, or some other cause, the amount of bromide of potassium soluble in it would not exceed two-thirds of a grain.

Mr. Clarke said he had used that proportion, but he was uncertain of the strength of the alcohol.

Mr. G. Wharton Simpson remarked that he thought there must be a singular mistake. Bromide of potassium was very insoluble in alcohol or ether, and the amount the Chairman had stated was the extreme quantity which could be dissolved in collodion made with solvents of the usual strength. If by any chance the alcohol became so much diluted as to dissolve the quantity named by Mr. Clarke, it would be utterly useless as a solvent for pyroxyline, and would, in fact, precipitate the cotton in collodion, to which it was added. Mr. Clarke's statement that a collodion containing a bromide only gave just the same results, with the same exposure, as a simply iodized collodion, and a bromo-iodized collodion, was also singularly opposed to general experience. He suggested to Mr. Clarke that possibly he had made some mistake using an iodide, instead of bromide of potassium. Under the circumstances, it would be satisfactory if Mr. Clarke would repeat his experiments with fresh chemicals.

Mr. Hughes said that the statements made by Mr. Clarke bore on one of the questions of vital interest to photographers, namely, the influence of bromides in collodion, and the effect of various colours upon them. He thought, however, Mr. Clarke must go over the whole of the experiments again, as there must be some mistake. It was impossible that the amount of bromide he had mentioned could be taken up, for if there were one salt used in collodion less soluble than any other, it was the bromide of potassium, and the statement that four grains had been dissolved, was so hostile to all experience, that they must ask for another and more careful repetition of the experiment. He called attention also to the fact, that in the plates experimented upon those colours described as having no action, really showed considerable reduction, the result produced by gamboge being nearly the same as indigo. There was, moreover, a general effect of fogging in the plates. In repeating the experiment, he would suggest the use of bromide of cadmium as being the most soluble bromide, and also the addition of some bands of black on the card as a starting point.

The Chairman stated that he believed some firms were in the habit of adding iodide of cadmium to what they called plain collodion, knowing that when it was afterwards treated with an alkaline iodizer the quality of the collodion would be improved by the presence of cadmium. Possibly all Mr. Clarke's results might have been vitiated from such a cause.

Mr. Howard suggested that in future experiments the greys and complementary colours, as well as primaries, should be tried, as it was with these rather than the primary colours, photographers had most frequently to deal.

Mr. Hughes thought that Mr. Clarke was right in trying the primary colours first, and thus endeavouring to establish first principles.

Mr. Simpson, in proposing the thanks of the meeting to Mr. Clarke, for the intention of his paper, suggested that he should begin again at the beginning. If possible, making his own collodion, assuring himself of the purity of his chemicals, and, for the purpose of assuring himself that any action taking place, was that of light from the various colours, and not spontaneous reduction or fogging, that some part of each plate be kept covered entirely, as this being quite clean and transparent would be a test of the chemical conditions. Possibly the Experimental Committee would think this subject sufficiently important to give some attention to it.

After some further conversation the subject dropped.

Two very fine photographs of interiors were presented to the society by Mr. V. Blanchard. Attention was also called to a fine solar camera picture, enlarged, by the same gentleman, and excellently coloured in oil by Mr. Wall. Both photograph and colouring received much admiration.

After the usual votes of thanks the meeting terminated.

Amateur Photographic Association.

We have received for publication the following report of a recent meeting of this Association:—

Committee.

The Most Noble the Marquis of Drogheda.
The Right Hon. The Earl of Uxbridge.
The Right Hon. The Viscount Ranelagh.
Sir Thomas Maryon Wilson, Bart.
Rev. William Thomson, D.D., Provost of Queen's College, Oxford, Chaplain in Ordinary to the Queen, &c., &c.
Matthew Marshall, Esq., Chief Cashier of the Bank of England.
Major Stuart Wortley.
James Glaisher, Esq., F.R.S., F.R.A.S., &c.
J. D. Llewellyn, Esq. F.R.S.
John Penn, Esq., F.R.S., &c.
George Shadbolt, Esq.

Honorary Secretary.—Mr. A. J. Melhuish.

Printers and Publishers.—Messrs McLean and Melhuish.

At a committee meeting of the above-named Association, held on the 30th ultimo, at 26, Haymarket, the Right Hon. the Earl of Caithness was duly elected a member of the committee.

Several practical details relating to the method of conducting the business of the Association, were discussed and arranged, and others proposed for future consideration. Numerous specimens of negatives, already sent in, were examined and approved, many receiving high commendation. Specimens of the proofs from some of the negatives, presumed to be a fair average of the whole, were also laid on the table. A report on the present state and future prospects of the Association was read by the Secretary and adopted by the meeting, as follows:—

It is with considerable satisfaction that I place before the committee the present state and future prospects of the Amateur Photographic Association, the scheme for which was first made known to the public in the middle of May last. Although hardly surprised, I felt much gratified at the outburst of approval with which it was received, and the very general and lively interest which it excited amongst photographic amateurs. From the first announcement of its formation to the present moment the list of members has steadily increased; this day, for instance, I have registered three new names, nor has its influence been confined to this country alone; but it has extended also to those on the European Continent, as well as to our most distant Colonies. This will be seen by the packets of letters now upon the table, including communications received from various localities in Europe, India, Canada, Antigua, Rio Janeiro, Cape of Good Hope, &c., which display an unanimity of sympathy with, and approval of, the objects of the Association, which is seldom witnessed. In fact, the sentiments expressed by correspondents, may be epitomized in these few words, which I extract from several of the letters before you, viz.:—

"I have much pleasure in joining the Association." "I cordially approve of the scheme." "I shall be glad to render it every assistance that is in my power." "I think the thanks of photographers are due to the gentlemen who have devoted their time and attention to the formation of so excellent an Association." "I believe it to be the very thing that was wanted."

The future prospects of this Association are no less satisfactory than its present condition. Although but a small per centage of the members have as yet sent in their negatives, those already received exceed four hundred, and whilst at least a multiple of that number may be safely calculated upon, should those who have yet to contribute do so, in anything like the same proportion, the number to be dealt with will be exceedingly large. Of the high quality of the negatives you will be able to judge from the several parcels now on the table before you, which have just been received, and from the proofs which I now exhibit, these being selected as a fair average sample from the whole of the negatives received up to the present time. I submit that these specimens demonstrate unmistakeably that we have amongst us photographers of whom the members generally may well be proud, and prove that the works of many amateurs are, to say the least, fully equal to those of their professional brethren. This Association, although little more than four months old, already numbers just one hundred and sixty members, and receives daily additions, so that we may fairly pronounce it to be a great success, being, to use the words of the prospectus, "An Exchange Club of the most extensive kind, a bond of union, and a medium of communication, such as no mere society, however excellent, can ever hope to offer, and which will give an interest and a stimulus to amateur photography, from which great results must flow."

Correspondence.

INTENSIFYING NEGATIVES.

Sir,—I see in your "Answers to Correspondents" one about intensifying negatives. I think the best of all methods is one I now use, viz., the application of a solution of the strength of about 2 per cent. of bichloride of platinum and subsequent washing. This leaves the proof, when dry, of a fine dark tone, and will be found excellent also for colouring positive transparencies for the stereoscope.—I am, sir, your most obedient servant, F. Maxwell Lyte.

Bagneres de Bigorre, October 7th, 1861.

PHOTOGRAPHIC FINE ART FOR THE MILLION

Sir,—The strong feeling in favour of photography that has lately been expressed by several of our most eminent painters who are actually employing it in the first delineation of their pictures, induces me to forward you a few remarks illustrative of the importance of this marvellous branch of the pictorial art. Every person at all accustomed to examine portraits, and compare them with the originals, knows well how rare it is to find a good likeness of the sitter. And though it is common enough to see a well painted picture, yet even this degree of perfection is usually acquired by a sacrifice of the truthfulness of the portrait; so that when we turn from one of the best productions of the pencil, and compare it with a photograph from the same sitter, we are struck with the marvellous stride that has been made by changing the laboured production of the easel, for the instantaneous result of the sunbeam. By this process the very perfection of God's own image is at once placed before us, and even distant scenery is copied with a perfection of perspective and accuracy of detail, far beyond any efforts of the human pencil.

Even the science of optics has received an impulse from photography that the most sanguine could hardly have anticipated, and it has been more cultivated for the improvement of the "camera" during the last ten years than it had previously been since the discovery of the telescope.

But the best feelings of the human heart have been greatly fostered by the labours of the photographic artist. The poorest artisan is now enabled to ornament his humble home with life-like resemblances of his family, who thus remain as durable mementos, whilst the cherished objects of his love are too frequently removed from his domestic circle; so that the result has been a higher patronage of portraiture than existed in Florence in the days of Lorenzo de Medici. Then there was but one patron, but now they are found in every street. Their name is "legion," and photographic portraiture is the best feature of the fine arts for the million that the ingenuity of man has yet devised. It has in this sense swept away many of the illiberal distinctions of rank and wealth, so that the poor man who possesses but a few shillings, can command as perfect a life-like portrait of his wife or child as Sir Thomas Lawrence painted for the most distinguished sovereigns of Europe.

With thanks for the large amount of useful information contained in your photographic miscellany, I am, yours faithfully, C. F. Partington.

Cornwall Crescent, Camden Town.

THE PISTOLGRAPH, MOONLIGHT PICTURES, &c.

Dear Sir,—The Photographic News of last Friday has just come to hand, containing your very excellent description of the pistolgraph. Permit me, however, to demur to the following:—

"For all objects beyond a distance of about twenty-five feet the pistolgraph requires no focussing, everything beyond that distance to infinity appearing in equal focus."

In practice, I find, when the instrument is charged with an excited plate, and it is desirable to pistolgraph, a group of unconscious equestrians advancing or receding at a sharp trot—yet as it might not be practicable "to put the group in appearance" where the focus was indexed, viz., at 25 feet, a quick definite turn of the plate-holder on its axis, to the right or left, at the instant of exposure, would give the required sharpness to the moving object at any distance between "the 25 feet" and infinity, Believe me, dear sir, Yours truly, Thomas Skaife.

P.S.—Apropos of Gaudin *versus* Breese on "moonshine." Some three years ago, whilst casting about for a suitable lens for my pistol camera, I espied a boy playing with one of Sir David Brewster's grooved spheres, commonly called a Codington lens, of about a quarter of an inch focus from back surface. Having prevailed upon the young philosopher to lend it to me, I at once set about testing the photographic capabilities of this little objective. Being satisfied as to its competency to deal with solar objects, I wished to ascertain how it might be trusted with lunar ones. So taking advantage of a full moon, I tripoded the little camarette, charged with a wet collodion plate, in face of my dwelling for half an hour; then developed with pyrogallic: the result was a tolerably distinct view of my house, with every window facing the moon clearly defined. After this, a back view was tried. The house being between the moon and the camera, a 20 minutes' exposure gave a sharp clear outline of the house against the moon-illumined sky. But it is not expected that M. Gaudin is such a *goube-mouche* as is *un tel mi Lord Anglais* to swallow such "*audacious moonshine.*"

TAXES, FOR PHOTOGRAPHY.—SUNDAY PHOTOGRAPHY, ETC.

SIR,—The "photographic nuisance" has, it seems, taken quite a different aspect from what it had at first. From the fact of a ruffianly fellow and his equally ruffianly "doorsman" illtreating a troublesome customer, and the consequent question of the best method of getting rid of such "dens," which we soon should see accomplished if we could but get rid of the "doorsman," or touter, as, without their assistance, the public would never be induced to enter such places at all,—from a consideration of this matter, the subject has been warped into a sweeping denunciation of sixpenny likenesses and Sunday photography, though where the necessary connexion exists between such a fact and such a consideration must have puzzled many of your readers. Now, sir, it is really too bad that all who take sixpenny portraits should be classed in the same category with the ruffian before alluded to. And as to the Sunday question, it is a purely religious one, into which I am very reluctant to enter; but I may say, that although neither I nor my brother (with whom I am associated) take portraits on Sundays, yet it is not because we consider it sinful to do so, but because we defer to the wishes of our neighbours. And I know that there are many *Christians* who hold the belief that Sunday is not the true Biblical Sabbath, but that Saturday is the proper day; and one at least of Mr. Swatridge's rivals (I know) holds the same opinion. And I should think the fate of the numerous "Sabbath Observance" Bills of late ought to convince the most bigotted, that the spirit of the age will not allow any further interference in that direction with the liberty of conscience.

Then, as to the proposal to tax or "*protect*" photography, I am sure that every well-wisher to the *art* as such, or as a profession, would be sorry to see it fettered in any way—its infancy having been sufficiently crippled, without now endeavouring to drown its more mature growth—but indeed after your able exposition of the fallacy of such a plan in the leader of this week's NEWS, there needs no further arguments from me to show the utter inapplicability and inexpediency of such a measure.

The proposal to found a college—from which to issue diplomas, deserves consideration; but it would be necessary that the examinations should include the *practical manipulations* of the art, as well as the theory, or the scheme would be not only useless, but positively mischievous. It is very easy to send specimens to the editor of a journal like the NEWS, in order to entrap the editor into remarks, so that *garbled* extracts from them may be used as puffs in country newspapers, but it is quite another thing to work before the practised eyes of veteran photographers.

I trust that you will excuse the length of these remarks; but I feel that it is but right that some one ought to vindicate the character of those who, like myself, are not above taking a sixpenny portrait.—I am, sir, your obedient servant, J. WALTER.

[Whilst willingly affording opportunity for the expression of opinion amongst every class of the photographic fraternity, we cannot admit personalities into our columns. Our correspondent will see, therefore, why we have omitted some passages from his letter.—ED.]

DEAR SIR,—Having read Mr. Swatridge's first letter on the subject of taxation of photographers generally, my first impulse was to write to you at once, denouncing the system as unjust and wrong in itself; for, as you say, in these days of free trade, our attention ought to be turned to abolishing all taxes of a similar nature, that have withstood the brunt of time up to the present day. Thinking that the affair might blow over, and no further notice taken of it, I was prevented doing so, but seeing another letter from him this week upon the same subject, and also one from another correspondent, a sense of duty to myself and others now compels me to drop you a few lines on the same vexed question. It is, in my opinion, wrong to suppose for a moment that by compelling photographers to take out a license for carrying on their calling, we should in any way put a stop to, or even mitigate, the nuisance so much talked of; for I believe that one half of the owners of these dens are much better able to pay for the said license than men of greater respectability and talent. The reason is obvious; they do not stick at the means by which they are to get the money, and I know from sad experience that there are men of worth and respectability, aye, some little talent too, who would I am afraid be utterly unable to do any such thing. I think it an oversight on the part of Mr. Swatridge to think that because he is so circumstanced as to be able to pay such a tax, there are no deserving men who are not. I know that there are such; that the manner in which they conduct their business, as also the quality of work done, there is no doubt about. I have likewise known, and still know, men who have nothing but their unprincipled ways and bad work to recommend them; yet such men get on, and, I repeat, better than some that are more deserving, and were the tax to be imposed on quality of work, so far as mere show goes, they would not be behind hand at the time of show, but that would not make them less unprincipled or better workmen themselves. I quite concur with him in his opinion that the public generally are but poor judges at present in matters photographic, for they will often go, not only the lower class, but those who think otherwise of themselves, to some low place, allured with the idea that they are about to have something cheap, and positively pay more for the same style of article, though of very inferior quality, than they would pay at once for a good article at a respectable place, but I think the public taste in such matters will soon improve, and then merit may fare better.

With regard to the proposition of W. B. N., I consider it much more feasible, and to display a much greater sense of justice, but I for one object to the system in all its phases, and am extremely glad to see that you take up the matter in the same spirit. Allowing you to make what use you may please of this, and apologising for troubling you, I am, sir, yours very truly, J. LEES.

SUNDAY PHOTOGRAPHY.

THE LONDON PHOTOGRAPHIC SUNDAY CLOSING ASSOCIATION.

SIR,—I am delighted to see this movement set on foot at last. To judge by appearances it is, perhaps, not quite safe; but the beginning of this association is very promising. Scarcely had the notice of its formation been placarded in this neighbourhood when it was evident that the thing was meant to be carried out. I could mention several studios, my master's amongst the number, *which were closed last Sunday for the first time since they were opened.* Until now, the photographer (whether master or man) has toiled day after day. The relaxation of a holiday, or day of rest, has been denied him. Good Friday, Christmas Day, and other like occasions, have been no boon to him. But I rejoice to see the movement taken up with spirit, and from amongst our own ranks, and I wait anxiously to see what its development will be. Not that I fear the result, for I am certain that the portrait making Sundays are numbered in this city, but the movement deserves, and must have, the sympathy and help of all who have suffered under the old system, like, sir, your obedient servant, A. DOORSMAN.

Photographic Notes and Queries.

THE RESIN PROCESS.

SIR,—Have any of your correspondents tried in the resin, or gum process, gum guaiacum. I coated a collodion plate with an alcohol solution of the gum after exciting, and exposed and proceeded to develop, and found my picture visible all over the plate and very intense. I added some to some uniodized collodion with the same results; a weak developer fully brought out the picture. S.

P.S.—The revolving front and one lens camera has been in use some time, I used one invented by M. Marriott, Esq., and manufactured by Messrs. Murray and Heath five years ago, for taking stereo views four on one plate.

Talk in the Studio.

Sunday Photography.—We call the attention of our readers to the following copy of a placard, which has during the last week been freely posted about the metropolis. We announced in our last, that an organization for the suppression of this nuisance was in course of formation, and shall from time to time keep them advised of its progress in suppressing this disgrace to the art:—"The London Photographic Sunday closing Association. Notice! this association is now being formed, under distinguished patronage. Public meetings will be shortly convened in all parts of the metropolis, with a view of making the movement universal! Notices of these meetings will be widely circulated; and it is hoped that the public will aid the photographic profession in its efforts to abate one of the greatest nuisances of the present day, viz., Sunday Portrait Traffic."

Poisoning by Cyanide.—On Tuesday an inquest was held on the body of Mr. John Baker, a gunmaker, who died from the effects of poison. He had desired his wife one night after retiring, to go into another room and bring him a certain bottle of medicine containing black draught. As soon as he had drank some he discovered that it was the wrong bottle, and exclaimed that he had taken aquafortis. He called immediately for mustard and water, which he drank. Medical attendance was at once procured, but very shortly the unfortunate man died. The bottle when examined was found to contain a weak solution of cyanide of potassium. Another illustration of the danger of having such deadly poisons standing amongst medicines or other articles of domestic use.

India-rubber Cement.—A cement called *marine glue* from not being affected by water, is made as follows:—Take one pound of india-rubber, cut it into small pieces and dissolve it in about four gallons of coal-tar naphtha, the mixture being well stirred for some time, till perfect solution has taken place. After ten or twelve days, when the liquid has acquired the consistence of cream, two parts, by weight, of shellac are added to one of the liquid. This mixture is put into an iron vessel having a discharge pipe at the bottom, and heat applied, the whole being kept well stirred. The liquid which flows out of the pipe is spread upon slabs and preserved in the form of plates. When required for use, it is heated in an iron pot to about 248° Fah., and applied hot with a brush.

Photography in the Reformatory.—A novel and interesting application of the art is now in daily use at the famous Mettray colony, near Tours, which is the first and most celebrated reformatory established in France for young convicts. Every urchin brought to this house of correction has his portrait taken the moment he sets foot in it, and another is made on the day of his leaving. The first represents the rags, dirt, and misery, the physical and moral degradation, the prematurely careworn features, the scowling, cowering, timid, uneasy, and withal ferocious look of the born thief. The second shows the same individual transformed by the magic of judicious discipline, which includes physical comfort and kind treatment. His dress is now clean and neat, and his countenance is redolent of health, contentment, benevolence, and energy. Philosophy had never in any age, a grander subject for contemplation than two such pictures. More than one of the English reformatories adopt a similarly interesting record of the good they effect.

The Tannin Process.—A correspondent sends us the following:—"To photographers who smoke: a piece of cotton wool steept in a solution of tannin, and put into the bowl of a pipe, as a plug, will remedy all the nausea and hot flavour of the tobacco."

Silver from Waste Solutions.—*The American Journal of Photography* says:—"We are informed that in one of the city galleries, during the past two months, there has been saved from the waste developing solutions *twenty-three ounces* of metallic silver. This fact establishes two other important and curious facts, viz.:—That a certain New York gallery in time of war has been doing a very good business, and that silver can be practically saved from the developer. We have believed and taught, for a long time, that at least seventy-five per cent. of silver, purchased by photographers, is needlessly wasted. There is no waste so easily prevented as that of the developer.

To Correspondents.

J. W.—The most certain way to prevent pictures from curling up or warping after mounting, is to damp the opposite side of the card, so that both sides shall contract equally in drying. As this is troublesome where there are many to be done, the next best plan is to avoid using much moisture in whatever is used for causing the prints to adhere. India rubber solution will answer the purpose, as will also, freshly made Scotch glue. These will cause less tendency to curling than paste.

Nautilus.—The black precipitate in your toning solution is probably a little reduced gold. The tones of those you send are good; we shall be glad to see the others.

West Countryman.—We have not used the iodide or bromide of magnesium ourselves, nor do we see any especial advantage in their use. We have recently seen some very fine pictures produced with a collodion containing them, but we think the gentleman who produced them would have obtained just the same results with any other of the usual bases for his iodide and bromide. We believe the magnesium iodide is less stable than many others. Most photographic chemists will probably keep it; Mr. Thomas makes a feature of it. We hope shortly to be able to publish the experience of an able photographer as to its use. Your suggestion regarding the society might be useful, but we fear there is no chance of such a thing being carried out.

Roselli.—To re-crystallise nitrate of silver, dissolve it by the aid of heat, in twice its weight of distilled water, then evaporate the solution with gentle heat over a water bath to half its bulk. Now set aside the vessel to cool, keeping it lightly covered to preserve from dust, &c. In twelve hours you will find fine crystals formed; pour away the remaining solution into another vessel, and leave the crystals to dry. This first crop of crystals use for purposes requiring great purity; those obtained from the remainder of the solution will do for common purposes, such as printing. 2. A good iodizing solution for collodion may be made as follows: 8 grains of iodide of sodium, 8 grains of iodide of cadmium, 2 grains of bromide of cadmium, in one ounce of alcohol 60° over proof. Add 2 drachms of this solution to 6 drachms of plain collodion.

H. Jones.—The yellow precipitate is carbonate of silver, arising from the addition of carbonate of soda in excess. It will be re-dissolved on adding nitric acid. Always neutralise with oxide of silver, which, combining with the free nitric acid, forms nitrate of silver. The proportion of nitric acid to be added to the baths in the formula you enclosed is very great; 4 drops to each ounce of solution are decidedly more than necessary. The strength of silver is, you observe, very great, 48 grains to the ounce. That is the reason for adding so much free acid, as without plenty of free acid strong baths are difficult to work without stains. A 40-grain bath with 2 drops of nitric acid will give fine results for positives.

W. May.—You will see an examination of your glass in the proper place. We shall be glad to learn something of the preparation of the samples which are suitable.

E. C. J.—We received your former prints as well as two now. At that time we scarcely saw how you could best avail yourself of the exchange system as it then stood, as postage with India would have been expensive. We waited, therefore, until the new arrangements then in contemplation were decided upon, which you will see in another page, is now done, and you can, by forwarding prints, with the requisite amount of postage, to the secretary, receive all the benefits of the Exchange Club. We are obliged by your prints, which are full of interest. We shall always have pleasure in receiving specimens of progress.

A. Stevens.—The description of Mr. Fox Talbot's process of photographic engraving, given in our "Dictionary of Photography," in No. 98, was necessarily only an epitome of the process. You will find full particulars, as stated in the specification, on page 73 of our first volume. We have not had experience in the matter ourselves. 2. The photographic ink is not now manufactured, we imagine. It simply consisted of nitrate of silver and nitrate of potash.

Wax Process.—Marion and Co. used to keep excellent iodized waxed paper; but since the demand is so small, we are uncertain whether it is kept at all now. You will probably procure the Canson paper of Mr. Saudford.

Ebonite.—We beg to inform some correspondents who have enquired on the subject, that Mr. Atkinson, of Liverpool, is agent for the photographic goods of Ebonite, manufactured by Silver and Co.

J. L.—We have seen excellent card portraits produced by the No. 1 B. lenses you name; and know many of our best artists who use them. They cover well, give excellent definition, and are very rapid. We do not know of any lenses better suited for the work except the No. 2 B of the same maker. These latter have produced by far the finest card portraits we have seen, the definition over every part of a standing figure being exquisite, and the action, in a good light often instantaneous. In securing rapidity of action in lenses there should be no loss in definition: as a general rule lenses giving the best definition are the most rapid lenses. There is, of course, a great advantage in these lenses in point of rapidity over ordinary half-plate lenses, but it is difficult to state the proportion without actual trial. We have not tried chloric acid in the silver bath. The addition of oxide of silver would form chlorate of silver. Since you find acetic acid so satisfactory, it would be folly to make any change.

N.—We are disposed to think the damage in the corner of the negative, which renders vignetting imperative, a fortunate circumstance, as unquestionably the pictures gains by vignetting, and we cannot conceive that any other form would be so beautiful. We should be very glad indeed to receive the series of specimens referred to, indicating the capabilities of weak baths; and any information regarding the mode of use to secure the best results. We will examine the prints received at leisure, and report upon them in our next. There was an error in the figures in our last answer, as the "*avoirdupois*" appended shows. "437·5 grains" should have been written for "480 grains." The confusion existing in the standard of weights and measures sadly wants rectifying. For an exact statement in of the strength of silver solution, see table in our number for May 2, of this year. "N" indicates a wish to preserve his incognito. We have been under the impression, how gained we scarcely know, that we were perfectly familiar with the letters which follow the initial, and at once examined the broken seal for the "red hand" we expected to find. The seal was, however, too much broken to afford us any satisfaction.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 164.—*October* 25, 1861.

PHOTOGRAPHY AND THE EXHIBITION OF 1862.

The consideration, so important to photographers, as to whose direction the photographic department of the forthcoming International Exhibition, shall be committed, remains, at present, undecided In a recent announcement of the names of sub-committees for undertaking the various departments, no allusion was made to photography, from which, we conclude, Her Majesty's Commissioners are still undecided on the matter. A fortnight ago we published a memorial which had been adopted at the South London Society, and forwarded to the Commissioners. The object of this memorial was to impress upon the Commissioners the importance of a speedy decision on this subject, and of entrusting the matter to capable men. We should be very glad, unless some decision is announced very shortly, if other societies would take action in the matter. Her Majesty's Commissioners must not be led to believe that English photographers are indifferent about a question of such vital importance.

We are glad to perceive that there are some signs of a better mind, in regard to this subject, in the management of the Photographic Society. The change is odd enough, and oddly enough expressed, implying, as it does, that the real nature of the offer made by the Commissioners, was not understood until now. A leader in the recently issued number of the Society's *Journal*, says :—

"We have received several communications from correspondents on the subject of what is called the recent concession of the Commissioners of the International Exhibition to photographers. It appears that a separate department is now to be given for the arrangement of photographs. If this is the case, we can only say that it is a great pity that this was not vouchsafed sooner, as it would have saved a great amount of trouble. We think that under these circumstances it would be very desirable for the Council to meet to consider what steps ought to be taken in the matter, as it is very important that competent persons should be appointed to help and guide the Commissioners in their labours. We urge this simply from the unanimity shown in the number of communications forwarded to us on the subject since the recent change in the aspect of affairs."

That this separate department should be accepted is what we have been steadily urging for months past, and we are glad to believe that, though late, our advice has, at length, produced some effect. We have availed ourselves of every opportunity of impressing the fact that since a separate department was to be granted, some "competent persons should be appointed to help and guide the Commissioners in their labours." The very phrase we have so often used was, that it was better to "guide," if we could not entirely control.

Singularly enough, however, the matter is treated as though this separate department was a "recent concession." "It appears that a separate department is *now* to be given," is the phrase used, and, it is added, "we can only say that it is a great pity that this was not vouchsafed sooner, &c." Now we must on behalf of the Commissioners, and in defence of our own consistency in urging the acceptance of a separate department during so many months past, point out the disingenuousness of this assumption of a recent concession. In the Society's *Journal* for June, we find a letter, dated May 16th, from Mr. Sandford, secretary to the Commissioners, in which, after pointing out that there was nothing in the decisions of the Commissioners which would prevent photographs being placed in juxta-position with engravings, &c., he distinctly adds that special space will be allotted to photography, and it is the hope of the Commissioners to "assemble in one apartment all the photographic apparatus and photography, so as to illustrate fully the state of photography as practised throughout the world at the present time." That is upwards of five months ago. So soon as this offer was made, we saw that especial advantages would attend such a separate department for the photography of the world, and we have persistently urged this opinion ever since. We are, as we have observed, glad to observe a change of opinion in our contemporary, the organ of the society; but it is too bad to assume that it is in consideration of some recent concession. How far the council can now act in the matter we cannot say, and how much less dignified any advances they may now make will be, than if the offer of the Commissioners had been accepted at the time, we leave others to determine. If any steps they can now take, and which can be accepted by her Majesty's Commissioners, will tend to the advantage of photographers and tend to the improvement of the photographic department of the Exhibition we shall be very glad. All our aim in this matter in what we have done in these pages, and elsewhere, has had but this object: we wish to see British photography fully, fairly, and honourably represented in an exhibition comprising the industry and art of all the world. Photography as now practised is essentially an English art. It derived its being from two Englishmen, Fox Talbot and Scott Archer. It is an English pursuit; there is not such an extensive amateur photographic public in any country in the world. And this is an English exhibition. If, therefore, British photography be imperfectly or shabbily represented, or if the exhibition be ill managed, the brand of disgrace will be a deep and lasting one.

We may here add that we have reason to know that the applications for space which arrived from photographers at the last moment are such as to justify the hope that if the contributions are in like ratio, and the department be well managed, a much more satisfactory result will be obtained than at one time seemed probable. How important a proper management of the department will be to its success, may be gleaned from the information as to the mode in which such things will be arranged in other departments, given in the following extract from a morning contemporary :—

"Excluding an incredible number of utterly absurd applications, which have been thrown aside altogether, the total amount of space demanded by intending exhibitors in the United Kingdom is 1,200,000 square feet, or just six times as much as the Commissioners have at their bestowal. It will be the duty of the several committees to bring down these figures to a manageable point. The metropolitan and local committees will have to look after the interests of their constituents, and to take care that particular branches of industry, or localities, are duly represented. The class committees will attend to matters of more national import, and will provide suitable room for chemical products, minerals, naval and military objects, general mechanism, and the fine arts. In short, the aggregate allotment of space which the commissioners have decided upon will be divided among forty classes, and subdivided among individual exhibitors, by a process of inter-consultation with the different committees."

It is quite clear that the necessity for a competent committee to manage the photographic department is a pressing one; and every photographer must begin to feel the importance of knowing the conditions which are to guide him in his preparations.

VALEDICTORY.

It is always a source of regret to us to have to chronicle the retirement from the ranks of any of the veterans of the photographic art. It is not, however, quite surprising that such retirements must occasionally take place. Photography is an engrossing pursuit, and requires for its satisfactory and successful practice, no half-hearted attention. Those who love it best will, when they cannot accord to it this full attention, be most likely to resign it altogether, unwilling to pursue the art unless they can give it the time necessary to success. We have now to take leave of the Rev. J. Lawson Sisson, a gentleman whose name has been honourably connected with photography from the very first. His waxed paper process has yielded some of the finest results which have ever been produced in that direction; and various of his suggestions, in connection with dry photography and other departments of the art, have been of considerable value. He writes to us briefly, saying, "I have ceased to be a photographer, finding that the art demands more time than I have now at my disposal." We may perhaps be pardoned for adding another quotation from his letter on a subject regarding which, although we often receive kind communications, we are, in our columns, always silent; but an expression of opinion from one so long known in connection with the art, and now leaving it, may excuse a breach of our custom. He adds, "I cannot, however, avoid saying that the News is, as far as I have been able to judge, the very best photographic journal published; and I most heartily wish it every success." Mr. Sisson is to us, personally, entirely unknown; but we, in common with all photographers interested in the early progress of the art, necessarily respect his opinion as well as his labours; and in wishing him a kindly farewell and good speed in his more immediate duties, we but give expression, we apprehend, to the feelings of photographers at large.

CORRECTING NITRATE BATHS.

A correspondent recently detailed in our columns such a history of "The Nitrate Bath and its Troubles," as might well nigh frighten the tyro just stepping on to the threshold of photography from proceeding any further in what might appear such a bewildering and perilous enterprise. The case there described was no doubt an extreme one, and not often met with, we hope, at least in such a virulent form. Every photographer has, however, at times met with more or less difficulty in the management of his bath, and we now propose, very briefly, to consider two or three of the remedies which have been recently suggested by practical photographers.

We cannot for a moment pretend to solve all the difficulties which we have heard described by first-class photographers as occurring in their own practice. There are some we have heard described which seem to defy conjecture as to either the cause or the remedy, and can only be attributed to the presence of some unknown impurity in the silver. We have never had the misfortune, in our own practice, to meet with a bath which we could not easily correct. Instead of misfortune we might have said good fortune, for our duties give us an interest in cases of failure or irregular action, similar to that felt by the pathologist in cases of morbid anatomy. Abnormal reactions are always interesting, as failures are stepping-stones to success. In our own practice, however, the disordered state of our baths has generally yielded to very simple treatment. Since the appearance of the "Nitrate bath and its troubles," several correspondents have written to suggest remedies. One experienced photographer writes to say, "I beg to forward a remedy which I have used now for three years, and have never known to fail. I can put any number of plates in my bath, sometimes as many as a hundred a day, and never fear its being out of order." The panacea on which this correspondent relies, and his practice demands that it should be a reliance, is "pouring into the bath a little (about a teaspoonful) of the cyanide fixing solution, two or three times a week, when the day's work is done. The bath will yield splendid results next day. If this should be neglected, and the plates should fog, I can then add the cyanide, and the fog will clear off at once."

He adds "I don't mean this remedy for a bath that is not sufficiently acid, but for one that fogs from what I suppose to be the excess of iodide set free from the collodion plate. The fog that is caused by alkalinity shows itself in marks up and down the collodion plate, whichever way it is placed in the bath. But the fog to which I allude is that which shows the picture with a veil completely over it. The picture develops apparently all right, but upon fixing it appears under a cloud," The first bath in which our correspondent tried this remedy, he states, appeared like "pea-soup," but on addition of the cyanide solution became at once clear, and worked perfectly.

Another correspondent suggests as an infallible remedy, and one which has been sold as a "trade secret," for high sums, the addition of a small quantity of chloride of gold. Another, following the same principle, suggests the addition of a solution of chloride of sodium for the same purpose.

It is quite possible that under certain conditions of the bath each of these applications might, on known principles, prove beneficial. The addition of cyanide would produce cyanide of silver, which being, comparatively speaking, an insoluble salt, would be precipitated. It is a well-known property of insoluble precipitates, so formed, that they carry with them, frequently, other foreign matter, with which a solution may be supersaturated. Iodide of silver in excess would thus be carried down, and possibly organic matter also. The nitric acid liberated on the formation of cyanide of silver, combining with the potassium, and forming nitrate of potash, would leave the bath in the same condition as regards acidity as before. Whether any trace of cyanide of silver might remain in solution, and how it might affect the working of the bath, we cannot say.

Regarding the action of chloride of gold or sodium, they would act in a similar manner by forming an insoluble precipitate, but in the case of the first a trace of nitric acid would be liberated, which might in some cases be an additional advantage. Some years ago Mr. F. Eliot proposed the precipitation of the iodide of silver from solutions of nitrate of silver by means of citric acid. Two grains of citric acid in solution were to be added to each ounce of silver solution. If a precipitate did not immediately fall, ammonia was to be added, a drop at a time, until a white precipitate of citrate of silver fell down, taking with it the iodide of silver, and probably some other accumulated impurities. The bath was then to be tested for acidity or alkalinity, and corrected accordingly. If alkaline from the additional excess of ammonia, a little nitric acid would be needed; if acid either from the nitric acid liberated on the formation of citrate of silver, or from a trace of citric acid in solution, oxide of silver might be added. This process was proposed with especial reference to removing iodide from baths which had been used for exciting collodion plates, in order to appropriate the solution to printing purposes.

Our own practice, in dealing with old baths surcharged with iodide of silver and organic matter, has been, first, to dilute the solution to half its bulk with distilled water, which, by weakening the solution, aided the precipitation of excess of iodide. We have then added oxide of silver, and after thorough agitation, exposed the solution in an open shallow vessel to the sun, or in a warm place, for some hours. This has effected the double purpose of blackening and reducing any organic matter, and evaporating excess of ether. Fresh nitrate of silver, sufficient to produce the proper strength, has then been added, and a plate tried. In some cases the bath works well at once; if not, a trace of nitric acid is added, and all goes well. We have never found this method to fail: it is a little troublesome, but only requires performing perhaps once in six or twelve months with a bath in constant use.

New baths, which refuse to work satisfactorily without the addition of an immoderate amount of acid, we simply treat with the oxide of silver, expose to light, filter, and again acidify. This is always sufficient. We know there are cases where this treatment fails, as we have heard of them from reliable photographers; but we have never met with them. As we have said before, such cases, we apprehend, are due to some radical impurity in the nitrate of silver.

PHOTOGRAPHIC PORTRAITURE.*

On the Dress of the Sitter.—With respect to *photogenic effect*, the dress of the model may be considered under two aspects: the nature and arrangement of the material of which it is composed, and its various colours. We shall afterwards consider the artistic effect required to be produced.

It is well known that woollen stuffs, and all those which present a dull surface, whatever be their colour, are very difficult to photograph. It is, therefore, preferable to adopt vestments composed of lustrous tissues and where the nature of the textile material, or rather the arrangement of the threads, produces brilliant reflections. Silks appear to merit the preference; but velvet, so rich in effect in all its shades, is far from being represented in all its advantages by a photographic apparatus. Glossy, lustrous, and shot fabrics, whether of silk, cotton, or wool, are the most suitable to be reproduced photographically.

As to the colours of the drapery, as a general rule, those must be avoided which form too violent a contrast with the complexion of the model. It is necessary to make a careful study of the manner in which photography translates the various colours, for a hue which appears a very dark one to our light will very frequently appear white in the picture, and *vicé versâ*.

Thus, blue, lilac, violet, and purple, however, dark they may appear, are always produced as light tones in photography, while yellow, green, and red, however light in tone, always appear more or less black. This difference in the translation of colour must be carefully studied and constantly kept in mind by the photographer.

With reference to the artistic effects which the artist must endeavour to obtain from the vestments and drapery, it has already been remarked that too strong a contrast between the colour of the vestments and the complexion must be avoided; we may add that too great a contrast between the colours of the vestments themselves must be equally avoided, so that the *ensemble* of the photographic image be harmonious and agreeable to the eye. Consequently, plaids of large patterns and large figures in all patterns, must be avoided, as tending to confuse the eye and distract it from the principal object, which is the face. To abuse the marvellous facility presented by photography, of representing the minutest details, is to misunderstand the office of the true artist, whose pure taste will always lead him to sacrifice details and accessories to the principal object.

Lighting the Model.—The rules to be followed in illuminating the model are very simple, and yet they exercise a great influence upon the success of the portrait. The principal condition to be considered is that of avoiding *zenithal* light, that is, such as falls perpendicularly upon the head of the model, producing opaque shadows under the eye-brows, nose, and chin, and on all the salient parts of the figure generally. A horizontal light, arriving directly in front of the model, or on one side of it, produces the best effects; still the light must be modified by screens and curtains, so that both sides of the face are not equally lighted. We naturally reserve the greatest effects of light for the side that exhibits most of the face, but we must also avoid depriving the other side wholly of light, otherwise, we obtain only a picture half light and dark, with a harsh effect of chiaroscuro most intolerable to the artistic eye.

Too strong a light greatly fatigues and annoys the sitter, and completely neutralizes the harmonious effect sought by the true artist. It is much the best to subdue all excessive illumination, even if it leads to longer exposure, provided it be not pushed to unreasonable limits. Portraits taken in the open air, except with a due appliance of screens, to modify the light are generally very inartistic.

Under certain cirumstances, such as when the operator has to work in an atelier situated in the narrow streets of a city, a glass-house, will be indispensable; in other circumstances, where there is large window with clear uninterrupted view, the best effects may be obtained by a judicious arrangement of reflecting surfaces.

* Concluded from p. 493.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Sulphuric acid—(coutinued).—One remarkable property of sulphuric acid still remains to be noticed, and that is, the action which at a certain degree of dilution, it exerts upon cellulose or vegetable fibre. It has long been known that this acid, under certain conditions, modified vegetable fibre, and after numerous experiments, Mr. Gaine discovered that when paper is submitted to the action of two parts of concentrated sulphuric acid (sp. gr. 1·854, or thereabouts) with one part of water, for no longer time than is taken up in drawing it through the liquid, it is immediately converted into a strong, tough, skin-like material. All trace of the acid must be instantly removed by careful washing in water. If the strength of the acid greatly exceeds or falls short of these limits, the paper is either charred, or else converted into dextrine, and the same conversion into dextrine also ensues if the paper be allowed to remain in the sulphuric acid many minutes after the change in its texture has been effected. In a little more than a second of time, a piece of porous and feeble, unsized paper, is thus converted into the parchment paper; a substance so strong that, as stated by Mr. Barlow, in his lecture on this subject, delivered before the Royal Institution, in 1857, a ring seven-eighths of an inch in width, and weighing no more than 23 grains, sustained a weight of 92 pounds; a strip of parchment of the same dimensions supporting about 56 pounds. Though, like animal parchment, it absorbs water, water does not percolate through it. Though paper contracts in dimensions by this process of conversion into parchment paper, it receives no appreciable increase of weight, thus showing, that no sulphuric acid is either mechanically retained by, or chemically combined with it. It has also been ascertained, by analysis, that no trace of sulphur exists in the parchment paper. This fact of the paper retaining its chemical identity constitutes an important distinction between it and gun-paper, or cotton. Unlike these substances, it is neither electric, nor is it soluble, in ether and alcohol. Unlike common paper, it is not disintegrated by water, and, unlike common parchment, it is not decomposed by heat and moisture. The strength of this substance, and its indestructibility by water, have caused it to be applied to many uses. It, to some extent, replaces vellum in book-binding, it furnishes material for legal documents, such as policies of insurance, &c., and it is likely, before long, to take the place of ordinary paper, in school and other books, which are exposed to constant wear. One great advantage of this method of treatment, consists in it being applicable to paper after it has been printed on, either from type, or in intaglio, as no part of the impression is obliterated by the process, the lines, owing to the contraction of the paper, being considerably sharpened, and a fine gloss being communicated to the surface.

At the time above mentioned, several experiments were tried by Mr. Crookes, on the applicability to photography of this method of modifying paper. It is well known to chemists, that, in many cases, a strong acid exerts a less energetic action upon bodies, than the same acid diluted; and it was found by this experimentalist, that the darkened portions of a positive paper photograph resisted the action as well as the paper itself. As several advantages are likely to arise from a more general use of this method amongst experimental photographers, we briefly give the best method of proceeding with the manipulation. Mix, in a sound stoneware jug, 4 fluid ounces of water with 8 fluid ounces of oil of vitriol of commerce, taking care to add the water to the acid, and stirring constantly all the time. To avoid danger of spilling the mixture owing to the jug cracking with the heat evolved when the acid and water mix, it should be placed in a basin of sufficient capacity to hold the contents. When the acid is cold, pour it out into a good porcelain dish, and by the side of this have two large pans of water. The photograph, which must be on unalbumenized paper, and quite dry, is now to be taken by one corner, and laid, picture-side downwards, upon the acid, taking care to avoid air-bubbles; then instantly lift it up, and lay the plain side on the liquid; this will be very easy with the assistance of a glass rod, as the acid has a tendency to cause the paper to curl outwards, contrary to the action of water. The paper must now be left in the acid, for a space of time varying from one or two seconds to as many minutes, according to the absorbent quality of the paper—unsized English paper requiring a very short time, whilst more absorbent paper requires longer immersion. When properly soaked, quickly remove the prints and transfer them to the first pan of plain water, where they may be shaken about rapidly to remove the excess of acid on the surface. The second pan of water should have a little ammonia in it, so as to give it a decided alkaline reaction, and as soon as the surface acid is removed from the print it is to be immersed in this alkaline bath, and there left for a short time, in order to make sure that no acid remains unneutralised. As soon as this bath shows the slightest tendency to redden blue litmus paper, a few drops of ammonia must be added, and the whole well mixed; for if even the slightest traces of unneutralised acid remain in the paper after removal from this bath, the picture will soon be destroyed. Photographers must not, however, forget that long soaking in ammonia is prejudicial to the half-tones of the picture, and the excess of alkali must therefore be but small. After being removed from this alkaline bath the sheets will require to be washed two or three times in clean water, and they can then be dried in any convenient way. When dry they will have an uneven. crumpled appearance, which can be removed either by rolling or by careful mounting whilst slightly damp. The result will be, in several respects, worth the photographers' careful attention and experiment. The colour and tints of the picture, even in the most delicate half-tones, remain perfectly intact, whilst the powerful, yet uniform contraction of the paper, adds considerably to the sharpness; the paper is moreover suddenly gifted with such great strength that not only will it bear very rough handling during the washing process, without the possibility of accidental tearing, but, owing to the horn-like character of the surface, it will at any time, even when dry and mounted, bear hard rubbing with soap and water and a wet cloth without any abrasion of the surface, if it is dirty enough to render such a mode of cleaning advantageous. Moreover, the surface (of an unalbumenized print) assumes a peculiar glossy appearance, giving a richer finish to the picture without the glare which is objected to in albumenized prints.

Another important advantage was suggested by the author at that time; it was stated as very probable that pictures so treated would be found to be less liable to fade than they otherwise are, and an experiment was described in which a rapidly fading print was treated in this way with marked advantage. We understand that Mr. Crookes has continued these experiments, and, as nearly five years have elapsed since the first prints were treated in this way, the results will throw considerable light upon this obscure subject,

We hope in a short time to be able to communicate Mr. Crookes' results to our readers.

INSTANTANEOUS PHOTOGRAPHY.

By Samuel Fry.*

The chemicals necessary to be carried on a trip for instantaneous pictures, are neither bulky nor numerous, and are simply (besides the bath and collodion) protosulphate of iron, acetic acid, hypo, pure iodine, pyrogallic acid, and iodide of potassium. Instead of the separate bottles of iodine, and iodide of potassium, may be carried a 4-oz. bottle of a mixture of 4 grains pure iodine, 4 grains iodide of potassium, and 4 oz. of common water.

I strongly recommend stereoscopic instantaneous pictures to be taken on plates $7\frac{1}{4}$ by $4\frac{1}{2}$, thus allowing a large margin, and permitting the best part of the picture to be selected, whether at the top or bottom of the plate. For obtaining instantaneous effects, I have already described a shutter inside the camera, opening from the top downward. This shutter is the same width as the diameter of the lens, and does not, therefore, occupy the whole of the space of the interior, and has not been found in practice to cause a dust, as has been suggested, and thus give rise to blemishes and spots on the plate. It is indispensable that the shutter open from the top first, as, though the whole time of exposure may not exceed one-tenth of a second, yet, even of this almost inappreciably small period, the foreground has, by this arrangement, a larger share. I was drawn to this conclusion by the result of a number of experiments I tried on the best form of dark shutters. By means of some thin boards and india-rubber string, various arrangements of spring shutters are easily made for experimental purposes. At the first glance it seems that, to fulfil all purposes desired, there should be two shutters, separating in the centre, which is thus exposed first; but though this is probably the way to obtain the most rapid movements, yet it will be found in practice that the foreground is constantly under-exposed, and the middle distance over-done; and I therefore still incline to my original system of an internal shutter opening downwards, in order to give most exposure where most is required. In photographing water and sky with shipping, great advantage is gained by being at an elevation of ten or fifteen feet, such as on a pier or break-water; for not only is a more natural vivid effect obtained by the rendering of varying shades, representing with great truthfulness many of the ever-changing tints of the surface, but we thus obtain reflections of clouds, and shipping in the water, in an enhanced degree, each contributing its quota of beauty and interest to the picture.

A deservedly favourite point with instantaneous photographers, is to include in their pictures steamers under full steam, but to accomplish this successfully requires some management, both to obtain the best photograph, and also the best artistic effect; it will soon be discovered that far better effects are obtained by selecting, if possible, a steamer when receding, than when approaching; the heavy swell from the paddles, the long, clearly-indicated lines of the steamer's course, the rounded stern of the vessel, the foreshortened side view, give exquisite details, and all within the scope of an experienced photographer.

My ordinary practice for development is to bring out the picture, as far it will come, with a 10-grain developer of iron; I then wash the plate with two ounces of water, and at once put it in a plate box without unnecessary exposure to daylight. In the evening, at leisure, I fix the pictures with hyposulphite of soda, and after thorough washing allow it to dry spontaneously. In this condition, and before intensifying, they may be brought home, and made deeper in colour at any convenient period afterwards. My usual proceeding for intensifying, is to first run a line round the plate one-eighth of an inch in width, of Hughes' black varnish, this dries at once, and prevents the film splitting off during

* Continued from page 495.

subsequent wetting. When this varnish is dry, wet the plate thoroughly with common water, in a room partly darkened; next pour off and on for one minute the mixture of 1 grain iodine, 1 grain iodide potassium, and 1 ounce of water; a slight darkening of the picture will be perceptible after washing this preparation carefully off, and then follow up at once with pyrogallic acid, 3 grains to the ounce, and with acetic acid as usual; before pouring on add a few drops of 30-grain solution of silver, kept for that purpose only. Intensity will be immediately acquired, and must be arrested when far enough, or hardness may result.

During the present year a large number of very fine instantaneous pictures have been taken, and the public taste has been thereby greatly improved, the once popular views of "cities of the dead," as those dull, deserted looking productions have been justly called, which have till recently satisfied the public, will no longer go down. Mr. England's exquisite views of Paris, with their great and charming variety of figures, horses, and vehicles, all in motion, give a life, an individuality, to the scenes, such as we can never again part with. Henceforth no views, whether of streets, sea, or country life, can pass without containing at least some of the attributes of instantaneity. This change will be of equal benefit to photographers and purchasers, for at the same time that a more severe censorship is exercised by the latter, the standard of excellence is so much elevated thereby, that both amateur and professional photographers are incited to fresh conquests, the apparently impossible gradually opens before them in unexpected clearness, and they find that they must either rapidly advance with the vanguard of progress, or be left hopelessly behind in well-deserved obscurity.

The one point, however, to which my previous remarks might not appear to apply at first sight, is the practice of portrait photography; yet in no branch of our art is instantaneity so desirable, or so difficult to obtain under ordinary circumstances. Truly, with recent appliances, the average exposure is reduced to, say, 5 seconds, and in the prime of the year, 2 or 3 seconds, in a good light, and this advance, it must be conceded, is of inestimable value as giving an approximation to "the consummation most devoutly to be desired"—instantaneous portraits—but we must never rest until we obtain either such sensitiveness of materials, or such power of reducing agents, as to be able to obtain our portraits in the "twinkling of an eye." Then, indeed, may we reasonably look for a large increase of knowledge of art principles; then, instead of being as it now is, a mere block, dead to all other ideas than the stern necessity of sitting still, the human face divine may beam with intelligence, show that there are brains inside the skull, and instead of being perpetuated with an expression seen at no other time than when "sitting for a portrait," may be taken during the flow of ordinary conversation, with an easy, natural individuality stamped on every feature and limb, that we are now but little acquainted with.

The promulgation of instantaneous photographs at a moderate price, will do more to inculcate a true artistic feeling amongst photographers than anything written on the subject; no words can convey to the mind anything like an idea of the perfect reflex of nature which they display. It seems hard to conceive how any intelligent, unprejudiced person can deny to such productions the right to enter the charmed circle of works of art, but we must remember that photography is very young, that in any branch of science, a long tedious study of first principles is needed before a certificate of competency is granted, that though many photographers may have relinquished in its favour, the "farm, and the merchandize," yet that if all work together with a will, it is impossible but that the art shall be placed in its proper position—an honourable niche in the temple of the arts.

EXPERIMENTS IN THE MANUFACTURE OF COLLODION.

Mr. W. S. Thompson communicates to the *Journal of Maryland College* the following record of experiments in the manufacture of collodion:—

"For the purpose of testing the solubility of the cotton in menstrua of ether and alcohol mixed in various proportions, I prepared a series of three, which I will designate by numbers, as follows:—

No. 1.	
Ether, parts, by measure	5
Alcohol, do.	1
No. 2.	
Ether, parts, by measure	4
Alcohol, do.	1
No. 3.	
Ether, parts, by measure	3
Alcohol, do.	1

FIRST EXPERIMENT.

"Sixty grains of carded cotton were immersed in the following mixture:—Nitric acid (sp. gr. 1·41), 1 fluid ounce; sulphuric acid (commercial), 1 fluid ounce. Having mixed the acids in a shallow porcelain dish, the temperature rose to 90° Fah., and fell to 80° Fah., when the cotton was immersed. At the expiration of ten minutes, the cotton was thoroughly washed with water, and dried at a low temperature. One part of this cotton, and 150 parts, by weight, of menstruum, No. 1, formed a very thick collodion, leaving a small quantity of undissolved sediment. With menstruum No. 2, in the same proportion, it also formed a good collodion, with about the same amount of sediment as in No. 1. With menstruum No. 3, in the same proportion, it formed a thick collodion, with scarcely a trace of sediment, or undissolved cotton.

SECOND EXPERIMENT.

"Sixty grains of cotton were immersed in the acid mixture in the same proportion as in the first experiment, in a deep porcelain mortar. Upon mixing the acids, the temperature rose to 105° Fah., and fell to 95° upon immersing the cotton. By this experiment, a more soluble cotton was formed than in the first experiment; but menstruum No. 3 proved to be the best solvent.

THIRD EXPERIMENT.

"This experiment was made with double the amount of material used in the preceding, in the same mortar. Upon mixing the acids, the temperature rose to 120° Fah., and fell to 110° Fah., when the cotton was immersed. The resulting cotton was entirely soluble in menstruum No. 3, but with Nos. 1 and 2, leaving a small quantity of sediment.

"From the foregoing experiments, I infer that an elevated temperature, say from 110° to 130° Fah., is favourable to the formation of a very soluble collodion cotton, and that a menstruum containing a large proportion of alcohol is the best solvent."

[Mr. Thompson appears to be considerably behind the age in his information on this subject. It has long been decided in this country that a moderately high temperature is favourable to the manufacture of a perfectly soluble cotton. Instead of placing the maximum temperature, desirable for the best results, at 130°, he might, with advantage, have placed it at 150°. In regard to the proportion of alcohol, instead of regarding one part to three, of ether, as a high proportion, he might, with advantage, have used them in equal parts.—Ed.]

M. BLANQUART-EVRARD'S METHOD OF PRINTING BY DEVELOPMENT.

Most photographers have seen and admired some of the exquisite developed prints which some years ago used to be sent out by M. Blanquart-Evrard. The method of producing them was a secret, the whole details never having transpired. Mr. Sutton, who at the time was working in conjunction with M. Blanquart-Evrard, has recently published the whole process, which until now he has not felt at liberty to do. We were examining some of the prints only a few days ago, and were more than ever impressed with the conviction that they possess a degree of richness, depth, and delicacy, rarely, if ever, found in a sun print on albumenized paper. The use of albumenized paper seems to have become a necessity: it certainly affords facilities for obtaining more of the detail in the negative, than plain paper. But there can be little doubt that it is an unpleasant necessity, and that only a conventional and acquired taste could tolerate a work of art, resembling an engraving, covered with a vulgar glaze. The developing process in question is described in the "Notes" as follows:—

"The paper was first steeped for some hours in a solution containing

Water	1 oz.
Gelatine	4 grs.
Iodide of potassium	4 grs.
Bromide of potassium	1 gr.

and then hung up to dry. It was Canson paper, and the iodide gave it a pale red colour.

"The next operation was to submit it to the vapour of hydrochloric acid. A mixture of two parts acid to one part water was put into a large leaden tray, having a close fitting top, with a large square hole cut in it, an inch smaller each way than the sheet of paper. The paper was then laid over the hole and exposed to the acid fumes, with a plate of glass laid on the top to keep it down.

"The exposure to the acid fumes lasted a quarter of an hour; after which the paper was removed, and immediately laid upon the surface of the nitrate bath, where it remained for another quarter of an hour. There were several nitrate baths in use at the same time, and the room in which the papers were excited, had an immense round stove in the centre, which made the room as hot as the Palm House at Kew Gardens. When the paper was removed from the nitrate bath, the excess of solution was blotted off, and it was hung before the stove to dry. The pieces of blotting paper were dried also, and used again for a similar purpose, until they became completely saturated with silver, and then they were burnt, and the silver extracted from the ashes.

"As soon as the sensitive paper was dry it was exposed under the negative. This was done at a *south* window. The pressure frame had wheels, and ran in and out upon a horizontal railway, and the window had a shutter, which worked up and down like a guillotine. A leaden pipe passed from the developing room to that in which the prints were exposed, and the girls that were developing used to send messages along the pipe to the girl who was exposing, to tell her what exposure to give, whether more or less. The exposure varied from three to twenty seconds, according to the light. The paper was laid upon a plate glass, the negative upon that, and another plate glass put upon the negative. There was no flannel under the sensitive paper, which was wrong, and the definition suffered greatly in consequence. Blotting off the free nitrate was another cause of bad definition. The faintest imaginable trace of the picture was visible on its removal from the printing frame.

"The nitrate bath was 40 grains to the ounce, acidified with four drops of nitric acid.

"The sensitive papers cut to the right size were taken in a card-board box to the girl who exposed them, and when exposed were taken away in another similar box. She worked by the light of a *bougie* when the guillotine shutter was down; but a pane of glass, covered with yellow calico, would have done equally well. How easy it is to find fault with another man's arrangements.

"The developing dishes were about 30 inches long by 20 wide. The bottom was made of plate glass, and this was let into a wooden frame about 2 inches deep. The sides and corners were built up inside and made watertight by means of wax and resin. A great many prints were developed together in these dishes, and they were repeatedly turned over and moved about in the gallic acid. The dishes were only washed in the evening when work was over, and all the prints, those beautiful ones in the "Album Photographique de l'Artiste et l'Amateur," were at first covered with marbled stains, which were easily sponged off afterwards. The hands of the young ladies who developed the prints were as black as a negress's—and when not engaged in that work, these same young ladies used to earn their dinner by digging potatoes in the neighbouring fields, or milking the cows, and churning the butter—one day printing views of the Parthenon or Edfou for the "Photographic Album," and the next cleaning out a cowshed, or peeling mangold wurzel. It would be odd if a Regent Street photographer could not beat these French peasant girls at printing by development, if he chose, and after he has been told how they did it.

"The prints were developed in a very hot room, temperature up to 80° at least. The time occupied by each print was about twenty minutes, and several girls used to stand at the same table, each with her dish full of prints, in various stages of development.

"As soon as a print was fully out, it was carried into another dark room, drained for a few seconds, and then put into fresh hypo, strength 5 per cent. Here it remained twenty minutes, and was then put into a second lot of fresh hypo of the same strength, in which it remained another twenty minutes. The first of these hypo baths was called the toning, and the second the fixing bath. If the print had been washed, and the first bath too strong, it would have been too much reduced, and the colour would have been red and rusty. But the unwashed print communicated slight toning properties to the first bath, and produced the exquisite colours for which M. Blanquart-Evrard's prints are remarkable. The fact of their permanency, notwithstanding this slight sulphur toning, arose from the large excess of silver over sulphur in the print. There was not enough sulphur in the paper to convert the whole of the silver into the yellow sulphide. In a developed print the mass of material which form the shadows is much greater than in a sun-print, as may be easily seen by holding both up to the light. Hence the superior permanency of the former under the action of small quantities of sulphur.

"Sometimes gold toning was employed, but that was the exception and not the rule.

"After the toning and fixing came the washing. In the basement of the building there was a large room containing several monstrous tanks, each having a perforated false bottom which could be lifted up and down. Into these the prints were put, and frequently moved up and down, and the water changed every half hour. A few hours treatment of this kind was considered sufficient.

"After a print was thus thoroughly washed free from hypo it was put into a bath of water acidified with hydrochloric acid, and this removed a yellowish deposit from the pores of the paper. The print was then washed again, and hung up to dry. When dry it was hung over a line in a glass room at the top of the house and there exposed to the full action of sun and air for several weeks, and this greatly deepened and improved the colour, by converting its redness into purple-black.

"The print being now finished, it was trimmed, and mounted with starch, and then placed in a press between hot plates of iron.

"Troublesome as all these operations may appear you are repaid for all by a print of extraordinary beauty of colour, both in the lights and shadows. If we are compelled to admit that in many of the prints published by M. Blanquart-Evrard there is a little want of definition, and of justice done to the negative, yet this fault does not seem to be attributable to the process, but rather to the mistakes in the manipulation to which we have already alluded—viz., blotting off the free nitrate, and not putting any flannel into the printing-frame. It is a pity that these faults were permitted, because as photography advanced, and negatives became sharper and better, the eye of the public seemed to crave after mechanical excellence rather than artistic effect, and albumen prints carried the day. But a vitiated taste will not last for ever, and the good time will arrive sooner or later when photographs of artistic subjects will have to be printed in an appropriate style, and then it may be proved that artistic treatment and mechanical excellence are not incompatible qualities, as they seem to some people to be now.

"Any good kind of photographic paper, French, English, or German, may be used for gallic acid printing, but they do not all yield the same colours and effects. By varying the reader will quickly discover which is the best for his purpose. He cannot go far wrong with any of the good samples of photographic paper.

"The colour of the print may be modified by a longer or shorter time over the hydrochloric acid. You will observe in every print before it is trimmed that the marginal part of the iodized paper which rested upon the lid of the leaden bath of acid, and consequently received less of the fumes, is grey and devoid of vigour, and at the same time over-exposed, so that the effect of the fumes of the hydrochloric acid is to give redness and vigour to the print.

"Out of the thousands of prints developed upon iodized paper at the establishment at Lille, which have passed through our hands during the course of five or six years, and of which we have since been able to hear, only two or three have faded. One can easily imagine that out of a large number of prints a few may have escaped washing altogether. But if a high degree of permanency must be granted in the case of prints developed upon *iodized* paper, the same is not true to an equal extent in the case of prints developed upon *chloride* paper. We have known many of these fade."

CRYSTAL PALACE SCHOOL OF ART, SCIENCE, AND LITERATURE.

The establishment of Classes and Lectures, which should in a proper manner utilize, for educational purposes, the vast and unequalled resources of the Crystal Palace, is now, we understand, no longer a matter of conjecture, but a tested fact. The School was commenced last year, and during the whole of last season progressed; the result, at the close of the first term, being highly satisfactory. The classes developed were those for ladies, and all the plans were carefully laid accordingly; but it is understood that the operation of the movement is not to be restricted to this, but to receive every practicable development. The services of professors of the highest rank in each study were retained, and in every feature of the organization the greatest care was exercised by the Committee that the highest character should be maintained in the instruction, and in the Lectures; and that the privacy and comfort of the Studios and Rooms provided, should be equal to the immense advantages in other respects; the instruction being, indeed, more a system of private lessons, with the luxury of the drawing-room, than in the commonly received mode of holding classes. The result has been in every sense satisfactory. The first families in the surrounding and increasing neighbourhood of the Palace have warmly taken up the advantages offered, and families from all parts of the country have taken residences near, that their daughters might enjoy the advantages of the masters, as well as a pleasant visit. The regulations and announcement for the new term, which commences on the 1st of November next, and continues till July 31st, 1862, have just been issued. The classes for Water Colour Painting, &c., are taught by Mr. E. A. Goodall; those for Figure Drawing and modelling, by Mr. W. K. Shenton, and for these the magnificent Art Collections of the Palace are all available. English is taught by the Rev. Philip Smith, B.A., and Professor Mariette of King's College, London, takes the French. Dr. Kinkel instructs in German, and no doubt will also give some of his famous lectures on the History of Art, delivered with such success at the South Kensington Museum. Italian is by Signor Volpe; and Latin as well as History, by the Rev. C. Boutell; Herr A. Sonnenschein, is the Professor of Physical Geography; Dr. Dresser, of Botany; Dr. E. Lankester, of Physiology, and Dr. D. S. Price, the Director of the Technological Museum, of Chemistry and its applications. For the Pianoforte, there are Messrs. Benedict, Lindsay Sloper, and Prout; Singing, the great Garcia, Mrs. Street and Miss Whyte; for Part-singing, Mr. Henry Leslie and Mr. J. G. Calcott, while M. Louis d' Egville teaches the Dancing. The first courses of Lectures will be by Dr. Dresser and Dr. Lankester, and will commence on the 17th inst. Dr. Dresser's will be on the "Arts of Decorative Design, and their relation to Botany," and will be specially addressed to those who may be preparing to exhibit in competition in the International Exhibition of 1862. Dr. Lankester's will be on the "Physiology of the Nervous System, in relation to Health and Education."

We have only one regret in connection with this subject; that is, that no class for instruction in photography exists. We cannot but think from the unusual facilities of the place, a valuable class for affording amateurs instruction and practice in photography, might be established. We presume that existing arrangements with the firm who contract for the photographic department of the Palace, may at present preclude the establishment of such a class. It is not, however, the less a matter of regret, and we commend the subject to the attention of the directors in any future arrangements which may be made.

A CHAPTER OF HINTS.

Sir,—Perhaps the following method of mounting photographs cheaply and neatly, may interest some of your readers. Having mounted the picture on card, as usual, lay it, face downwards, on a clean sheet of glass of the same size as the cardboard; bind the edges together with a sort of stiff, leather-like, coloured paper (which can be got at any stationers), making, in fact, a sort of passepartout; rings can be put on tape, gummed on the back of the picture, and the whole back covered with marble paper; this can be applied to large pictures at a very trifling expense. If liked, a narrow edge of gold stamped paper can be put round the face of the glass, over the edge of the binding paper.

Among a few dodges I have found very useful, let me say a word for a very handy plate warmer, described by Mr. Gutch, some months ago; it answers well for drying dry plates; a very small quantity of hot water warms it, as the steam fills it; mine cost 3s. 6d.

Plates can be easily heated, for varnishing, over the chimney of a moderator lamp, being careful to keep the plate moving, to heat equally.

A very handy thing in the dark room is a common biscuit tin, about a foot square, and open at the top; it serves for putting plates in to dry, with a cloth over to keep out dust, and is better than a grooved box, as it does not tear the edges. I also put my Gutch's warmer in it to dry dry plates out of the way of dust.

The best washing bottle I have yet had, is a preserve bottle, with a large mouth, in which is a cork, with a piece of tin tubing, the mouth of which can be pinched to any shape; where economy of water is an object, not a drop is wasted with this.

Lastly, let me advise everybody to keep a photographic memorandum-book: I merely enter enter in mine a word or two to direct me to the journal where I have seen the information on any subject I may require hereafter; so on turn-to my book, and the heading on which I want to know something, I find references to the subject to many places. I have found little bits of dodges, like the above few, so useful to myself, that I venture to think others may derive some benefit from them.—Yours obediently, G. Smith.

PROPOSED IMPROVEMENTS IN PHOTOGRAPHIC LENSES.

BY PROFESSOR EDWIN EMERSON.*

Sir David Brewster, in his "Treatise on the Stereoscope," repeatedly and earnestly insists on the importance of taking the photographic negatives by a lens of very small aperture; he gives as a general rule, "an aperture as large as the pupil of the eye;" and he makes also the following declara-

* From Humphrey's Journal.

tion:—"I have no doubt that when chemistry has furnished us with a material more sensitive to light, (than that possessed in 1856), *a camera without lenses and with only a pin-hole will be the favourite instrument of the photographer;*" in the meantime, however, he suggests that "the use of a lens of rock-crystal, which has a low dispersive power, and having the ratio of the curvature of its surfaces as six to one, with an aperture of one quarter of an inch, would make an approximatively perfect camera."

Being convinced, by the excellent results obtained by myself, that a small aperture was indispensable to success in point of sharpness, which was a confirmation of Sir David Brewster's main idea, and having been furnished, by my friend Professor Rood, with an instantaneous collodion, I began to test, by careful experiments, Brewster's notion of a pin-hole camera, and also the use of a quartz lens for the camera; I also endeavoured to determine approximatively how small the diaphragm of the ordinary photographic camera should be reduced so as to secure the best results. The instrument in my possession is a very excellent stereoscopic camera, fitted with two portrait combination tubes, and the best achromatic lenses of Harrison's make. The results were either obtained by this camera or were compared with its work.

Photographers generally focus upon the ground glass of the camera with the unaided eye, and of course, in a majority of instances, get only an accidental approach to a perfect focus; and when the aperture is over half an inch, for lenses of 6 or 8 inches focus, only a small portion of the whole picture is in focus at all. Those who use a magnifying glass, and a small diaphragm succeed better, but by neglecting to reduce the diaphragm to a minimum, their results are by no means as perfect as they might be. By the aid of a common magnifying glass one and a-half inches in focal length, with which to view the image on the ground glass of the camera, and an aperture of two-fifths of an inch in the diaphragm in taking the negative, I was able without any difficulty to obtain results fully equal in point of sharpness to the best French transparent views. But in attempting to improve upon this, by reducing the aperture, and by increasing the power of the focussing lens, two difficulties were experienced—1st. The light was so much diminished that it was nearly impossible to see minute shades of difference in the sharpness of definition, and, 2nd. The inequalities of the finest ground glass were so much enlarged, as seriously to obscure and distort the view projected upon it. This last proved an insuperable bar to any higher degree of excellence by these means, as a singular irregularity in the ground glass was magnified quite enough to obscure many fine details.

Moreover, with a small diaphragm of the size recommended by Brewster, the light was so faint that a variation of half-an-inch in the distance of the lenses of the camera from the ground glass produced no *perceptible* variation in the sharpness of the image. A series of experiments was then made with two objects in view,—1st. To carry up the power of the focussing lens, and, 2nd. To substitute for the ordinary ground glass of the camera something of finer texture, so as to stand the microscopic enlargement, and of more transparent quality, so as to increase the light. An ordinary Fothergill plate, covered with the delicate yellowish film of iodide of silver enabled me to carry the magnifying power to fifteen diameters, with an aperture of one-fifth of an inch.

At the suggestion of Mr. Grunow, of New York, a plain glass plate, lightly covered with dust, was tried, which, with a power of fifteen diameters, rendered practical the employing of an aperture of three-fifths of an inch.

But in all the experiments with a single microscope the focus was too indefinite and uncertain for the accurate work I had in view, although the sharpness obtained was far beyond anything I had seen produced by the professional photographers. Indeed, among both British and American artists and amateurs in photography there seems to be a wide difference of opinion as to what may be regarded as *a standard* on this important point. I have not seen a suggestion of the proper means of determining it; which is, undoubtedly, an appeal to the compound microscope.

At this stage of the investigation Professor Rood constructed for me a compound microscope of a power of thirty diameters, which I hoped to be able to employ as a focusser.

This instrument I had intended to use upon the focussing plate of plain glass delicately covered with dust, but it occurred to me that plain glass alone would answer to focus upon, and if so, all the obstruction caused by magnified particles of dust, and the want of sufficient light, caused by the opacity of the Fothergill film, or anything of a similar character, might be entirely overcome. A trial showed that the amount of light was greatly increased; but I was now unable to determine the position of the image projected by the lenses of the camera. The lenses of the camera in connection with the lenses of the microscope formed a telescope of considerable power, the lenses reciprocally supplementing each other, so that no matter where the image produced by the lenses of the camera might be formed in space, the microscopic focusser could be readily adjusted to suit it, and give a perfect view.

To obviate this uncertainty, fine parallel lines were drawn by a diamond, one-twentieth of an inch apart, upon the surface of the plain focussing-glass nearest to the lenses of the camera; the microscope was then carefully adjusted to distinct vision of these lines, and its lenses fixed in that position. It was now easy to cause the image formed by the camera to coincide in position with these parallel lines, and thus the perfect physical focus for the sensitive plate was absolutely determined, allowance, of course, being made for any difference between the chemical and visual foci, which this arrangement afforded a means of adjusting with the greatest accuracy.

By this method of focussing very small objects, such as a single leaf of an elm over half a mile distant, were distinctly visible, and were readily focussed upon; and also the difference in the focus of objects at a mile, and those at a mile and a half in distance, was made apparent; which is utterly beyond the power of the single microscope.

The use of a small diaphragm enabled me now to secure the very finest details in all the objects visible in an extended landscape, so that they would bear examination under the compound microscope with a power of 150 to 200 diameters; or, in other words, with a power as high as the structure of the collodion would bear. Up to this I had supposed that the lenses of my camera were of the same focal length, as very delicate manipulations had failed to detect any discrepancy between them; but by this method of focussing, a variation of nearly one-fifth of an inch was detected immediately. By the use of the instrument the aperture was reduced to one-tenth of an inch, which from careful experiments I regard as about the minimum for good results, for lenses of six inches focus.

I was now prepared to test the ideas of Sir David Brewster, 1st. With regard to a small aperture. 2nd. With reference to a rock-crystal lens; and, 3rd. As to a pin-hole alone substituted for a lens, in connection with a very rapid collodion.

By means of the binocular camera I was able to make two experiments simultaneously, on the same plate, the left hand view being taken by the portrait combination, and the right hand view being taken with a quartz lens, or a common glass lens, or a pin-hole, as the case might be. The scenes, or objects photographed, were always exposed to the full light of the sun; and the plate, in each pair of experiments, was, of course, subject to a uniform treatment, under similar conditions as to collodion, baths, &c. I was thus able to compare the results of the various experiments, side by side, with the action of the achromatic combination.

The results of these experiments may be summed up as follows:

1. It is found in practice that a quartz lens is quicker in action than a common glass lens of the same aperture, focus, and thickness.

2. A quartz lens is very slightly quicker than the double combination of achromatic lenses; but it will not afford anything like so sharp details, even under the smallest diaphragms. "A quartz lens camera, with a quarter-inch aperture," is, therefore, very far from being "an approximatively perfect camera."

3. The simple pin-hole will not compare under any circumstances with the commonest glass lens, as it gives no sharpness to the picture, and requires from three to seven minutes' exposure, with the most sensitive collodion. This lack of sharpness might have been predicted theoretically. To give sharpness to the image, the pin-hole must be as small as the smallest detail in the view required, say the ten-thousandth of an inch, otherwise the rays of light from a single point travelling such paths as are indicated in the diagram produce necessarily a blurred image; thus sharpness will be in proportion to the smallness of the pin-hole; now as a pin-hole of the one-fiftieth of an inch in diameter requires with the most sensitive collodion an exposure of several minutes, it is apparent that a hole, the ten-thousandth of an inch in diameter, would require an exposure entirely impracticable.

We are compelled, therefore, to regard Sir David Brewster's pin-hole camera as an optical, as well as a photographical, absurdity.

4. The diaphragm for lenses, 6 inches in focus, can be reduced down to about an aperture of one-tenth of an inch with a very decided improvement in sharpness, if the compound microscope is used to focus with on a plain glass focussing plate: but when we reduce the aperture below this there is a loss of sharpness, owing, it may be, to the approximate parallelism of the rays.

5. A good use for a pin-hole camera would be as a simple instrument for testing the sensitiveness of collodions, and I would recommend it for this purpose.

PHOTOGRAPHY AND THE FINE ARTS.

BY COLEMAN SELLERS.*

That the war has begun in England between the photographic societies and Her Majesty's Commissioners is not strange. The exclusion of photography from the ranks of the fine arts seems to me very unjust. That art or employment which confers the greatest amount of good on the greatest amount of people, and at the same time calls for the exercise of the highest mental attainments on the part of the artist or operator is the one entitled to the greatest respect in its class.

The engraving or etching claimed among the "modern fine arts," is not the work of an artist, it is the work of a printer, who may be a very uneducated man with no artistic taste. The copper plate which produced the print is the work of the artist, and in the print we see the proof of the perfection of the artist's work. This artist, however, has but the one mental faculty called into play. He has acquired great skill in cutting certain lines, all according to certain fixed rules, and much—very much of his work has perhaps been performed by ruling machines and lathes, of the construction of which he is ignorant. If now an ingenious mechanic should arrange machinery that an oil-painting could by the machine be copied on a plate of copper, each shade and form reproduced by certain combination of lines and stipple, the print from this mechanical engraving would take its place among the works of great masters and enjoy the select society of the fine arts.

We know that a medal or other bas-relief can be engraved by a ruling machine in a much more perfect manner than can be done by hand, yet the product is a picture produced by a machine; that machine is then the artist, or the workman who turned the crank is, for the product of the machine is an engraving and can be admitted into Section 4 of the Great Exhibition. If now we take a step above engravings and into the domain of painting, let me not be charged with disrespect if I assert that it is more of a mechanical operation than photography. A grandson of Charles Wilson Peale, I claim as the descendant of a painter, a right to speak of painters, many of whom I am moved to say, have been my dearest friends.

* From the *American Journal of Photography.*

In old times before the making of colours became a trade, the pupil of a great master was first put to grinding paints; he was, through a long course of apprenticeship, taught to mix and compound from earths, metals, and vegetables, all the brilliant colours that were the special charm of his master's work. That the works of the great masters have in some cases been more permanent than that of others, was due to their greater skill in preparing their pigments. Here there was required a practical knowledge of the chemistry of the substances used, and scientific skill outside of painting. Now, however, the artist furnishing stores have put up in such neat little metal tubes, all kinds of tint and shades of colour that the modern artist is almost ignorant of the slab and muller.

It is better that this should be so, for the more all arts and sciences are subdivided into specific departments, to each of which the undivided talent of the operator can be given, the more advancement will be made in the arts generally.

But still, the taking of the mechanical mixture and grinding of paints out of the artist's hands does not make the remaining opeeration any the less mechanical. His genius may point out to him a grand subject, but to work out that subject he looks about him for matter to copy—ideal faces are in most cases portraits of living people.

The artistic skill is thus divided into three departments:—The genius of conception, judgment in the selection of subjects to act as models in the composition, and skill in imitating the appearance of the model. The two first are as necessary in photography as in any of the other graphic arts, and of the last I would like to say a few words. Painters have their own touches peculiar to their manner of handling the brush and using their colours. These peculiarities are copied as far as may be one from another; they have their tricks of trade, and he is the most skilful who has at his finger ends the most ready resorts to produce effect. Any one who has heard artists comparing notes will know how true this is. There has been a veil thrown around the painter's studio,—and the stamp of genius placed on the works of the favoured ones.

They have been lifted above the mere mechanic, and they have remained seated even while royalty has done them homage. As far as I am concerned Her Majesty's Commissioners have done no harm in excluding photography from the fine arts and placing it in the more useful 2nd Section of the Great Exhibition.

The question, however, is, as to whether they have made a proper classification when they so place photography? I must confess that it was with surprise I found no mention of the art in the enumeration of the classes of the 4th Section, and thought for a moment that photography had been ignored, nor was my surprise diminished when I found it in the 2nd Section. The cultivated mind of man seeks to reduce all things to order by proper classification and what reason there can be for the exclusion of photographic pictures from the society of pictures made by other processes is more than I can understand.

A print made by any of the new carbon processes is as much a photograph as those made with the salts of silver. The composition of the colouring matter of these carbon prints is the same as the black in the printer's ink of an engraving; these are both pictures, may be of the same subject, and yet forsooth, the photograph cannot be classed with its more fortunate rival, and is excluded from the select company of the fine arts. The truth of the matter is, photographers are looked upon as men who, without any scientific skill, slop a plate with collodion, dash over it sundry liquids, and lo! and behold! a picture is made, in far too easy a way to be genteel. If it did but require some weeks of labour to make one good negative, then it would be a work of art, instead of being considered the sloppy amusement of men who have not the talent to draw.

Permit me, in refutation of this erroneous notion, to sketch a photographer as I know many to be, and then I will let my readers be the judges whether or no he is an artist, and whether his work should not be classed with the fine arts.

In the first place he must be a willing student of books, well versed in chemistry, a student of nature, with a keen perception of the beautiful. If he be inclined to portraiture he must be a gentleman easy of manner, and of such address that he can give ease and assurance to the sitter. He must at a glance see their character and notice their peculiarities. He cannot hide their defects as a painter can, but he must study to throw them in the shade. And if he desires to make his picture a beautiful composition he must, in the shortest possible time, group around his sitter such accessories as will suit the character; to complete the picture a background is need; he has sketched a clean sheet of white flannel, on which, with a practised hand, he draws with charcoal, in rapid strokes, a landscape suited to the sitter; his knowledge of effects shows him how to work up his various distances, and produce the best result. All this must be the work of a few minutes.

Then comes the delicate study of light and shade; on the face of age the deep furrows of time, tinged red by the light falling through the overhanging flesh, look not like shadows in nature, but he knows that in photography they are the darkest shadows imaginable; hence, by ingenious reflecting screens he must, without destroying the shadows needed for rotundity, light up these wrinkles by other rays; he must study the amount of light on the eyes, taking care not to make the white spot or high light too large.

Then while anxious about the delicate manipulation of the dark room, he must, by his easy manner, give assurance to his sitter, that the face may be lighted into animation, and not frozen into rigidity. His chemical process must be conducted with such certainty of success that failures must never depend on himself, but always on the sitter.

The picture thus produced is more truthful than the most pre-Raphaelite production of painters' skill; it has required in its production talent of the highest order, and yet even if printed with carbon, as an engraving would be, it cannot be classed among the *fine arts.* Let not what I have written be considered as detracting from the merit of artists, far from it; but as a passionate lover of good pictures, no matter by what process made, I must speak my mind freely, and say a good word for that art which of all the arts of design is most likely to confer lasting benefit on all mankind.

PHOTOGRAPHY IN A COUNTY COURT.

Beard *v.* Lady Holland.

In the County Court of Surrey, holden at Chertsey, September 21st. Before John Farquhar Fraser, Esq., and a Jury.

This was an action brought by the plaintiff, who is a travelling photographer temporarily located at Weybridge, against The Right Hon. Lady Holland for the sum of £22 10s. for 180 photographic views of St. Ann's Hill, her ladyship's seat at Chertsey.

Mr. Pearce, instructed by Mr. Binns, of Trinity Square, Southwark, appeared for the plaintiff, and Mr. McIntyre, instructed by Stephens and Matthews, of Essex-street, Strand, for Lady Holland.

It appeared that the plaintiff in the month of July last had solicited permission from J. H. Browne, Esq. (Lady Holland's architect and agent), to take some views of St. Ann's Hill for a work to be entitled "Seats in Surrey," which he alleged was about shortly to be published. This being consented to by Lady Holland, some specimen-views were taken by the plaintiff and sent into the house for Mr. Browne to look at. As he had been recently engaged in making extensive improvements to the house and grounds, of which he was desirous of having some views taken, he agreed with the plaintiff to take ten different views, and to have supplied to him ten copies of each, the plaintiff offering to do them at 2s. 6d. each, or £12 10s. for the series,—the agreement being that the views should be well and carefully taken, and that advantageous times should be selected so as to get a good effect as regards light, &c., and that perfect photographs should be supplied. Spots from which the views were to be taken were marked out, and a memorandum of the order entered by Mr. Browne in his pocket-book. Two or three of the views were taken, and submitted for Mr. Browne's approval; but he pointed out many defects, which the plaintiff promised to correct in the others. Nothing more was heard of the plaintiff till some time in August, when he brought to Mr. Browne, at his house in Bayswater, 200 copies of seventeen different views. Of the ten views ordered by him only nine had been executed—those not in accordance with the order—and all very badly and carelessly taken; some evidently had been taken in the rain, others on a windy day. They were at once rejected by Mr. Browne, as not being in accordance with his order and the plaintiff's agreement, and from the badness of execution were useless to him.

The plaintiff was examined in support of his case, and stated that he had been a photographer sixteen years, and that he had received the order from Mr. Browne for eighteen different views; that he had seen Lady Holland on the lawn, and in the drawing-room, and in one of the halls, and that on one occasion she had looked through the camera and admired the view, and that Mr. Browne, in giving him the order, had asked him for how much he would take her ladyship ten copies of each view, and that he considered he was taking the views for Lady Holland.

Mr. Parry and Mr. Powell (of Chandos-street), photographic artists, were called by the plaintiff, and said that the photographs were good fair pictures, and that they could not have supplied similar ones at the price charged; and that in their opinions the retail price for such views would be 7s. 6d.

At the conclusion of the plaintiff's case, Mr. McIntyre submitted to His Honour that no order had been proved to have been given by Lady Holland, and that an order for photographs was not within the general scope of agency, and that the plaintiff's case against Lady Holland had failed. His Honour, however, considered there was sufficient evidence to go to the Jury.

Mr. McIntyre then addressed the Jury on behalf of Lady Holland, and after going through the facts of the case commented severely on the action having been brought at all against Lady Holland; the only reason for so doing having been, he said, evidently to frighten her ladyship into paying an unjust demand.

On the part of Lady Holland, Dr. Diamond, Secretary and member of the Photographic Society, and Editor of the Journal of the Society, having examined the photographs, pronounced them to be some of the poorest attempts at photographic pictures he had ever seen, and that the work had been very carelessly and negligently performed; that he would not have accepted them as a gift, as he considered them worthless. The plaintiff himself having stated that his camera was blown over by the wind on three occasions, proved how little attention he had paid to the selection of a proper time for his work. The witness exhibited some pictures lately taken by Mr. Vernon Heath, illustrating the difference between a good and a bad photographic landscape.

Mr. Browne proved most distinctly that he had given the order for the ten different views for himself and not for Lady Holland; that when the plaintiff brought them to his house, he at once saw they were so badly done, and not in accordance with his order, that he refused to take them, and gave the plaintiff notice to take them away; instead of doing so, however, the plaintiff caused the present proceedings to be taken against Lady Holland.

His Honour, in summing up, after commenting upon the evidence, was clearly of opinion there was no evidence of any order by Lady Holland, but left it to the Jury to decide if they thought that any evidence had been adduced by the plaintiff of any authority on the part of Lady Holland to her agent to order the photographs, and to say if the plaintiff had sued the right party; and said, if the Jury were of opinion that an implied authority had been established, they must then consider the question of the quality of the photographs, and say whether the work had been properly performed, and in accordance with the contract.

The Jury returned a verdict for the defendant.—*The Photographic Journal.*

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 23rd October, 1861.

The new photographic process announced by Professor Balsamo, of Lecca, which appeared in No. 154 of The Photographic News has been submitted to a practical test by Dr. Schnanss, who pronounces emphatically against it. He says, "this process, which contains so many new facts both in chemistry and photography, greatly astonished me on perusal. But, as is justly remarked, we must prove before judging. Acting on this principle, and upon another, *nil admirari*, during my career as a chemist and photographer, I have learned to make such experiments with sufficient circumspection to enable me soon to recognise truth from charlatanism. I never allow myself to be convinced by a single experiment, but repeat it three or four times before forming a conclusive judgment upon the process in question; for I very well know that to succeed with the simplest process, we must follow a certain routine, and that failure is frequently attributed to processes when the fault really lies in the unskilfulness of the operator. I have proceeded in this manner with Professor Balsamo's process. Like all chemists, I was ignorant that phosphorus dissolves in hydrochloric acid without undergoing any change, or that light caused it to give a flocculent precipitate. This curious fact did not, however, appear to me impossible, so I commenced my experiments by digesting some pure phosphorus in concentrated hydrochloric acid, and putting the bottle containing it into a vessel of hot water for several hours. The phosphorus became liquefied, exhaled much vapour, but did not dissolve at all. I remarked that the phosphorus liquefied by the hydrochloric acid retained this form after cooling several days; but the moment it was touched by some hard substance, as a glass rod for instance, *it hardened immediately*, as much so as before its liquefaction. This phenomenon does not appear to have been observed previously.

I left the phosphorus for four weeks longer in the hydrochloric acid, but I did not discover the least tendency in it to dissolve. To one portion of this acid, I added the concentrated solution of acetate of copper, until the liquid assumed an orange tint. Some chloride of copper was doubtless then formed. In this solution, I immersed (in the dark) some sheets of paper, which I left in it for a space of time varying from five minutes to five hours.

After completely drying them in the air, the paper was still further dried over a lamp, because Professor Balsamo stated that paper was sensitive only when perfectly dry. In this condition the paper assumed a yellow colour, which, however, disappeared on exposure for some time to the air.

The dried paper was then placed beneath a negative, covered with a sheet of bibulous paper, and exposed in the pressure-frame to the direct light of the sun, for various spaces of time, the longest exposure being four hours.

Not the slightest trace of a picture manifested itself: the paper did not even acquire a grey tint, it only became white, as stated above. This phenomenon proceeds from the humidity of the atmosphere, and has not the slightest connection with the pretended photogenic properties of the cupro-phosphor hydrochloric solution.

However, I did not despair, but repeated the printing process five times, still with the same result—failure! Finally, I placed my hopes in the developing power of sulphuretted hydrogen. Having filled a porcelain capsule with sulphate of iron, I poured on it some diluted sulphuric acid, and covered the capsule with the paper I had exposed to light in the pressure-frame. This also was attended with a fruitless result. The paper acquired a general brown colour, which became deeper when the paper was moistened, but without showing the slightest trace of a picture.

As all my efforts were abortive, I have thought it my duty to publish the results to prevent photographers from wasting their time unprofitably, in experimenting with phosphorus, as well as to show how eager charlatanism ever is to glide into the domain of true science. It is sufficient to compare the simple and excellent tannin process of Major Russell with this pretended new phosphorus printing process, with its pretentious theoretical explanations, possessing no value whatever, to be convinced of the truth of the assertion above made.

PHOTOGRAPHIC EXCHANGE CLUB.

Dear Sir,—I was glad to learn from last week's News, that the "Stereoscopic Exchange Club" is about to be re-organised; and there seems little doubt but that the scheme now proposed will give universal satisfaction, provided the judgment of the gentlemen acting as referees be given fairly and impartially; not that *I* entertain a doubt but that it will.

But my object in writing, is to offer a few suggestions relative to the new "Photographic Exchange Club."

The first being, that *portraits* of the *members* be admitted into the general exchange, each member sending two, three, or more copies of his own portrait, to receive a like number in return—the name of the member to be written on the back of his portrait.

2. That some plan be adopted to prevent members having sent to them duplicate copies from the same negative, either portrait or view.

Permit me to suggest the following scheme: — Each member to number his negatives consecutively, from which he intends sending prints, each print having written on the back the number corresponding with its negative.

The secretary to be provided with a list of all the members, each name to be followed by the *consecutive number of his negatives*, thus:—"Tom Jones," 1, 2, 3, 4, 5, 6, &c.

Now, each member sending prints for another exchange, will accompany them with the names of the members, and the consecutive numbers of the members' prints he is already in possession of; so that the secretary, on referring to the list, will at once see which prints he has before sent. For example, suppose I have got prints from Tom Brown, Frank Fairleigh, and Harry Coverdale, and I wish to send off another batch for exchange. Now, it is just possible that I might get copies of the same prints over again. My plan would obviate this, in the following manner:—I send off prints for exchange; on a slip of paper, which accompanies them, is written,—

"Tom Brown," 3, 5.
"Frank Fairleigh," 4, 6.
"Harry Coverdale," 1, 3, 5.

Now, the secretary, refering to his list, will see that he has not to return prints 3 and 5 of Tom Brown's number, nor prints 4 and 6 of Frank Fairleigh's number, nor yet prints 1, 3, 5, from Harry Coverdale; but any of the other numbers which follow their names may be sent in return.

Apologising for troubling you with the above suggestions, I remain, yours, &c., R. M.

Bamber Bridge, Oct. 22nd, 1861.

Talk in the Studio.

Architectural Photographic Association.—We regret to announce that this association has ceased to exist; that it has, in fact, from several causes, proved a failure. The stock of photographs, &c., we see are announced for sale.

New Electric Light.—The *Times* Paris correspondent says:—A trappist, named Delalot-Sevin, of the Abbeye de la Grâce-Dieu has made a discovery which will probably produce a revolution in the system of lighting and heating public and private buildings. He has invented a new pile, much stronger, and at the same time much cheaper, than the pile of Bunsen. By means of his photo-electric apparatus he produces an electric light as cheap as gas; and with his thermo-electric pile he supplies caloric on economic terms hitherto unknown Several of these apparatus have been constructed, and one is at full work in the Abbeye de la Grâce-Dieu. Manufactories for the public are shortly to be established in Paris, and at Lyons. The apparatus for producing gas will not be given to the public until after the Exhibition at London, next year; but that for heating buildings will be made public on the 16th of December next. The inventor has been authorized to make public experiments with his system of lighting on the Place Saint Jacques in Paris, and on the Place Bellecourt, at Lyons.

Photography at the Exhibition of 1862.—Mr. Leighton writing to the *Journal of the Society of Arts*, says: "Perhaps in no art has there been greater progress made, since our last decennial Exhibition, than in that of photography—an art that, by the use of collodion, has risen from a mere toy to a giant power and boundless pleasure—a power that I hope may not be turned against us in 1862. Photographers must be up and stirring if they want to compete with the results I have seen in the northern capitals of Europe, and which, doubtless, are to be found in the south also. I allude to the life-size portraits taken by the action of light, of heroic proportions and artistic worth, reminding one of the best works of such great masters as Rembrandt, Reynolds, Velasquez, and Opie. I know it is the idea here that objects the size of life cannot be done satisfactorily to compete with the works of our artists—a great mistake, that we may find to our cost in next May. If we had nothing to contend with save the miserable heads exposed in one or two of our leading thoroughfares—great faces, or rather "likenesses," without expression, being libels on humanity in general and individuals in particular—we should have little to fear; but such is not the case. From Berlin, Dresden, the Hague, Aix la Chapelle, and Brussels, we shall have first-rate full-length portraits, looking more like grand paintings in sepia, than tarnished silver fixed by a chemical process, independent of the artist's touch as I presume them to be, though some hold otherwise. All I can say, from several at present exhibiting at an Exposition in the Palais du Prince Héréditaire, at Brussels, is, that if touched by artists they are a great credit to their powers, and the result highly satisfactory; but I do not believe nature in this case has required such aid or had it. At Brussels, in the Exposition I name, are several life-sized portraits, remarkable for breadth of effect, and artistic treatment; a half length of a man, in a loose coat, with a broad felt hat in his hand; and another of a gentleman reading, on a bed, or couch, much foreshortened; also one of the Emperor of the French, I think taken from a small album portrait. The miniature painters' occupation is nearly gone, and we may, perhaps, see the second-rate portrait painter also superseded, and the same negative made to print pictures for the walls of town-hall, or mansion, or for the album in the lady's boudoir.

To Correspondents.

M. D.—The cause of the snowy appearance in some stereo prints is a slight amount of hardness caused by over development, or too free use of silver in development. The delicate little secondary lights which surround the high lights, are all buried, and constitute, with the high lights, so many snowy patches of light. This becomes much more obvious when the prints are examined in the stereoscope, although quite apparent to the educated eye without the stereoscope. The softest and most delicately detailed pictures are best for the stereoscope, as they will appear perfect with its aid, even when to the eye alone they look feeble and lacking in brilliancy. 2. The silver bath for sensitizing paper should be slightly acid; because it gives more brilliant prints, does not so rapidly become discoloured itself, nor does the paper so rapidly discolour in the dark as when it is neutral or alkaline. A little nitric acid is best, but very little will do. 3. Mr. Fry published a method of making the silver bath so that it should not discolour, which consisted in the use of common instead of distilled water, and never filtering out the precipitate; but always leaving it in the bottle, and shaking up with the solution. A bath made in the ordinary way will not so soon discolour with acid, as we have just said. Floating the paper previously on alcohol is of no use. We shall shortly have something to say on this subject more fully.

T. K.—The American photographic journals can be obtained through any of the American booksellers' agents in this country, or direct from the offices of the said journals.

W Smith.—The composition of the preparation called "Alabastrine Solution" is a trade secret. Various recipes have appeared in our columns for solutions intended to produce similar results. In all cases the bases is bichloride of mercury; various additions have been tried with a view to modify the cold blue tone which is generally produced by that agent alone; but we are not aware that any of them have suceeded so well as the solution named "alabastrine."

J. H. J.—As a rule, the quantity of citric acid should be about half that of the pyrogallic acid.

R. Gornon.—The markings in the sky are the result of the developer having been repelled by the film in those parts, and as it has acted energetically, development has commenced before the plate was perfectly covered again. The collodion of which you speak is sometimes apt to repel the developer, causing it to flow as if the plate were greasy, especially if in hot weather one end of the plate has become partially dry There are two or three modes of avoiding this:—first the addition of a little more alcohol to the developer, which will make it flow over more readily; next using a much weaker developer, so that its action is not so rapid, giving time to get the plate well covered before development commences; next, to wash the plate entirely with a little distilled water before developing, and then add this water with the free silver it contains, to the developer, and finally to use a large quantity of the developer so as to cover the plate with a rapid sweep. In hot weather, and with large plates, it requires very skilful manipulation and use of every aid to avoid such marks. The picture is much finer, however, with those slight marks, on the tinted sky, than it would be with a white one. The subject is a very good one, and would not be spoiled if an inch of the stained part were cut off.

W. R. A.—The blisters to which you refer are doubtless due to the paper. All samples of *Rive* paper are more or less subject to these blisters, but as that paper gives more brilliant prints than any other, and as the blisters generally disappear on drying, it is not always a matter of sufficient consequence to lead to the rejection of the paper. The cause of these blisters is uncertain. 2. The proportion of acetate of soda to be used in the toning solution is not arbitrary; different operators vary it to suit their own taste. We have found about half a drachm to a grain of gold the best proportion. Experience is the best guide in these matters. When you wish to try any formula, always take it, in the first place, as you find it. If it answer, well; if not, then there may be propriety in considering whether it is to be given up altogether, or only modified.

G. G.—We have not generally been pleased with the action of citric acid in conjunction with iron.

Iodizer.—You may mix the iodides and bromides of potassium, ammonium, and cadmium in collodion, in certain definite proportions, without disadvantage; but if you use the iodide of potassium with the bromide of cadmium, you had better not use more than about half a grain to the ounce of the latter, as there is a tendency to form the bromide of potassium by double decomposition, and that salt is not easily soluble in greater proportion than we have stated, and if formed it would be precipitated. There is an advantage in using the iodide of cadmium with either of the others you name alone, but we do not know of anything to be gained by mixing all three.

J. A.—We prefer the use of oxide of silver for neutralizing the bath. Add a few drops in water and agitate well: then filter 2. When the red spots which occur in toning, from the prints being in contact, or other causes of irregular or unequal action, are very marked, there is no remedy. When they are discovered before the inequality is great, they may, by continued toning, be obliterated without overtoning the remainder of the print.

J. L. Davies.—Strong silver baths, and highly iodized and bromized collodion, give the richest glass positives. Some persons like a strength of 48 grains of silver to the ounce. Where the bath is strong it should be very acid, otherwise it is difficult to work clean. 40 grains of silver, and 2 drops of nitric acid to the ounce, will give excellent results. 2. We cannot pronounce as to which is the best positive developer, as opinions differ. We have produced excellent results with many developers. 20 grains protosulphite of iron, 20 minims of glacial acetic acid, and 1 minim of nitric acid, form an excellent positive developer. 3. It is very easy to obtain instantaneous positives if the chemicals are in good order, the lens good, and the light sufficient. 4. We know of no simple way of uncovering the lens more rapidly than by means of a piece of cloth held in the hand and worked quickly. Dallmeyer's shutter is very good; and he is just bringing out another which is still better.

James Busby.—We see no reason why rain-water, filtered through a carbon filter, should not answer for every photographic purpose. We never use distilled water except in the silver bath, and the first washing of dry plates.

G. C. P.—We cannot tell you of whom you can get instruction in the preparation of photographic slides for the magic lantern. Various articles on the subject have appeared in our columns from time to time.

H. A., A Distressed Printer.—Your case, as stated, appears somewhat inexplicable. We have no doubt whatever, however, that the discolouration results from the action of sulphur. The fact that the prints of a purple brown tint when taken from the toning bath, turned a blueblack in the hypo, is alone very suspicious. But the prints themselves show numistakable proofs of sulphur action. We suspect that the fixing solution of hypo having been as you state, used before, was exhausted, and just had sufficient strength, on long immersion, to change all the silver in the prints into the insoluble hyposulphite of silver, which rapidly decomposed in the process of washing, producing the yellow brown tints that the prints possess. The only difficulty in this view of the case, arises from the fact that imperfect fixation generally presents a mottled-brown appearance known as the measles. The only way to account for the even brown tint is the half hour's immersion in the hypo, giving time to produce an effect throughout that is generally only partial. New hypo will remove the difficulty.

Photo. Student.—"Odling's Manual of Chemistry" is published by Longman and Co. Part I. only, is out, price 9s.

Several correspondents stand over until next week for want of space.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 165.—*November* 1, 1861.

PHOTOGRAPHY AND THE INTERNATIONAL EXHIBITION.

We have pleasure in announcing to our readers some satisfactory intelligence regarding this matter. We are authorized to announce that Her Majesty's Commissioners have decided to appoint a Committee to superintend the Photographic Department. This Committee will consist chiefly of amateur photographers, men of standing aud position, in whom, it is believed, photographers generally will have confidence. The list of names is not yet completed: we shall give full details in an early number. We are glad to be able to add that the number and reputation of the applicants for space, promise a satisfactory representation of photography.

ENGINEERING AND PHOTOGRAPHY.

Photographers have little dreamed, whilst enforcing their claims to a proper classification in the International Exhibition of 1862, of the heavy disgrace, and serious dilemma into which they were plunging themselves. The sad fact must, however, be announced. They have actually incurred the displeasure of the editor of a newspaper called the *Engineer.* He is, however, magnanimous, and does not intend entirely to crush the art, nor even to ignore it altogether. Here is the paragraph in which, blending severity with forbearance, whilst denouncing photographers, he still promises occasional recognition to photography:—

"Photographers have lately pretended to be so much affronted by having their works classed with those of engineers, by the Great Exhibition (1862) Commissioners, and have so strongly insisted upon separating themselves from us, that we are not disposed to show them any great amount of favour. For our part we never much coveted their company, believing that engineering art both requires, and secures, more brains than one is accustomed to find among photographers, and, consequently, that we should be degraded rather than otherwise by their society. But as we do not wish to be harsh, even to an inferior class of people, and as it is often useful for an engineer either to employ one of these photographers to take a picture of a machine for him, or else to take one for himself—which he can often enough do very well—we shall continue to give photography an occasional place in our columns."

The writer of the above paragraph seems to be incapable of perceiving that two things may be each equally respectable, and yet have little or nothing in common. Photographers, in protesting against an anomalous and incongruous classification, have never for a moment been guilty of the folly and rudeness of depreciating mechanicians or their art. They have protested that photography was not a mechanical art, that its merits could not be tried by the same standard, or on the same principles as the mechanical arts. Surely, it would be the madness of folly to place in juxtaposition, and attempt a comparison of, the respective merits of a steam engine and a photograph. There is no point of analogy, no ground of comparison between them. The most cunningly devised power-loom, or the most efficient steering apparatus, might receive small justice if they were to be examined for their pictorial beauties. Photographers desire simply to be judged by the standard of excellence to which they aspire in producing their works. They aim at pictorial beauty, not at the display of mechanical ingenuity or engineering skill. There is nothing in their art to give scope for, or illustration of, mechanical excellence in any pre-eminent degree. It is no derogation to a hatchet to say that it will not do the work of a razor; it is no affront to a locomotive to say it is not a picture. It is one of the simplest canons of criticism, one of the most obvious dictates of common sense, that everything should be judged after its kind, tested by the standard of merit belonging to its own order, and by that standard only.

It is not because they arrogated for photography any position superior to that art which has claimed some of the proudest names in the history of civilization, such names as Watt, and Stephenson, and Brunel, that photographers have protested against the classification in which they found their art; but because the position was au anomalous one. Because it implied that their productions were to be estimated by their mechanical qualities, which, if they had any excellence at all, must be the very lowest merit they possessed. Because it implied, that the truth, the delicacy, the artistic qualities of their productions, were due only to a mechanical operation, similar to grinding a barrel organ. If photographers were to be judged by their mechanical skill, the best of them must necessarily take rank below the inventor of a patent smoke-jack or knife-cleaner. These do involve some, it may be a good deal, of mechanical ingenuity and personal skill. They must show the mind of the man. If photographs were simply mechanical productions, they might more forcibly illustrate the perfection of the machine which produced them, than the ability of the man who turned the crank and ground out the pictures.

Photographers protested against the first classification, not because they despise engineering skill, or mechanical excellence in those arts which display its triumphs; but because excellence in their art is not, and cannot be, illustrated by mechanical skill, and because they do aim at what, in pictorial art, is a higher standard of excellence. They asked to be associated with kindred arts, and not with those with which they could claim neither comparison nor affinity. Admitting to some extent the justice of their claims, Her Majesty's Commissioners have granted them a separate department, in which they will stand on their own merits, and with this we believe most photographers are content.

We will not imitate the petty rudeness of the *Engineer*, by affecting to despise engineers, or regarding them as an "inferior class of people" as he does "these photographers." We rather prefer to believe that such a writer is in no sense their representative, and counsel him in future to endeavour to discriminate more justly. In continuing "to give photography an occasional place iu his columns," let him be assured that the advantage will be rather that of his readers, than of the art he affects to depreciate and patronise.

DRY COLLODION, WITH ROSIN.

BY SAUNDERS VAN LOO, AMSTERDAM.

Every photographer who has experimented upou dry collodion, must have arrived at the full conviction that this question is not easily resolved. A multitude of recipes have been recommended, which doubtless give some sort of result, but none the desired one.

Among the best methods recommended, are doubtless those of Duboseq and Robiquet: the preserving processes in which resource is had to hygroscopic agents are almost entirely out of favour.

A modification, or rather simplication, of the amber process is found in the use of common rosin, as recommended by the Abbé Despratz. This is an excellent method, and the one I proposed to follow, when some months ago I undertook some researches upon dry collodion.

While operating, I soon discovered that the method in question gave rapid and satisfactory results, always on condition that the whole of the ingredients of the collodion were favourable to the formation of a perfect picture, without the fear of seeing the plate entirely fogged.

Sometimes, by chance, the collodion may be quite suitable to the end in view, and then the addition of some rosin is sufficient. I asked myself if it were not possible to establish the conditions of success in every case; that is to say, to prepare a certain dry collodion, with the object of rendering the method proposed by the Abbé Despratz more general; and after an infinity of experiments, I fortunately succeeded.

I shall give a description of the modifications which appear to me to be useful to effect in the wet collodion process, when it is intended to operate by the dry method; modifications which consist only in the *changed proportions* of the ingredients which enter into the composition of photographic collodion.

Although we encounter difficulties enough in the practice of photography by the wet collodion process, the dry collodion process demands still greater scrupulous care. To illustrate this fact, I will give an example: every operator understands that there are two ways of obtaining upon collodion a film of iodide of silver of a thickness and opacity suitable to photographic manipulations by the humid way. No difficulties occur if the proportions of the iodides or of the gun-cotton, vary a little. It is understood that in the wet method, a slight surplus of pyroxyline is equivalent to a little less proportion of iodide; and in like manner, a larger quantity of iodide implies a lesser quantity of gun-cotton: in a word, with wet collodion we can always obtain films of appropriate thickness and opacity; but in dry collodion things are quite different.

Numerous experiments have taught me, 1st, that there is a great difference between the two cases mentioned above; 2nd, that the collodion exclusively applicable to the dry process with rosin, requires the conditions indicated in the second case, that is to say,—to succeed, we must choose a compound of collodion which contains *much* iodide and *little* gun-cotton. This is the whole secret of the composition of dry collodion with rosin, which yields constant results. Nevertheless, the control of the matter is not so very easy. Difficulties must often be overcome, which arise from *too great* a change in the proportions. If the proportion of iodides is *too great*, that of the gun-cotton becomes too little. In this case, the set film of collodion is not in a condition to contain all the iodide of silver upon leaving the nitrate bath; and it is especially in fixing the picture with cyanide of potassium that the greater part of the particles of reduced silver are carried away by the stream of water employed to wash away the fixing solution. The whole image disappears, while the film of collodion, properly so called, remains adhering to the glass plate. It is an easy matter to obviate this inconvenience; for nothing is wanting to this collodion but a little gun-cotton; thus by adding a quantity of plain collodion and taking a fresh picture, we perceive that the image resists the stream of washing water, after it is fixed, if the silver bath be of proper strength. Care must be taken to avoid too great an addition of plain collodion; for a film that is too opaque, on account of an excess of pyroxyline, always gives fogged pictures, notwithstanding the addition of rosin.

As stated above, chance may furnish us with just such a collodion as may require nothing but the addition of a small dose of rosin to yield pictures exempt from fogging.

I shall now proceed to give a summary of the method I practice, which is always successful.

The collodion must contain:—

Not too much Ether, 50 per cent.
Much alcohol.
Much iodide, (iodides of cadmium and of ammonium.)
Very little pyroxyline.
Ordinary rosin, 1 per cent.

A little water added to the collodion, or what amounts to the same thing, the employment of a non-absolute alcohol, is not objectionable, too great a quantity must however be avoided, manifested by little drops under the sensitized collodion-film.

It may be asked, if it is not possible to assign exact proportions in this formula; I reply, that the quantities required may be ascertained after taking a few pictures; besides, it should be remembered that all the operations of dry collodion suppose some familiarity with photographic phenomena, and suggest the total impossibility of giving absolute quantities; one collodion will require 1 per cent. of pyroxyline, another double that quantity; the same quantity of two different sorts of gun-cotton rarely yield a collodion of the same consistence.

The quantity of rosin varies between 1 and 2 per cent. However, it is my intention to make a quantitative analysis of dry collodion, in order to ascertain by analysis what will always be very difficult to discover by synthesis.

With regard to the silver bath, I have already stated that its richness in nitrate is of some importance: if the bath be too weak, the image will vanish in washing the film, even if the collodion consists of the proper proportion of iodide and pyroxyline.

Seven of nitrate appears to me the best proportion to 100 of water; then the addition of a few drops of acetic acid assures the transparency of the bath, otherwise it becomes dark in a few days.

Upon removing the plate from the silver bath it is immersed in rain-water, and then rinsed in a second bath, and put to dry in a dark place free from dust. One of the advantages of this method doubtless consists in the sensitiveness of the films. Thus the time of exposure is much less than usual, when operating with dry collodion, dextrine, gelatine, or tannin.

The time of exposure varies according to the more or less sensitive quality of the collodion; that which I am now using requires thirty seconds in the sunshine, with a compound objective; with an half-inch diaphragm, a minute is required. This shows that the sensitiveness of the plates is sufficient for all ordinary purposes. I have also made some experiments to ascertain how long plates thus prepared will retain their sensitiveness without losing any of their good qualities. I have found that at the expiration of nine days they gave as good pictures as on the first day. Upon operating with the same collodion in a wet state, in the usual manner, the exposure required is the same, but the image is frequently rather weak. By this we perceive that my collodion, of itself, is not very sensitive, and perhaps the dry process may be accelerated by selecting a collodion which gives a negative picture more quickly, but I have not yet made the experiment.

After the exposure of the dry plate, we may take a reasonable time to develop the picture, sooner or later; but if much time be allowed to elapse, we shall not succeed without immersing the plate in the nitrate bath, and leaving it there until the last bubble of air adhering to the plate has disappeared from the film. These bubbles may be removed sooner by taking out the plate and blowing upon it.

The image is developed by pyrogallic acid; the solution must not be too strong. The Abbé Despratz has recommended the development of the image to be effected by immersing the entire plate in a dish containing the developing solution, to avoid stains occurring at the spots where the developing solution is poured on. The image soon appears and goes on developing until it reaches the desired condition of strength. The developing is then stopped by washing the film in ordinary water, and fixing it with cyanide of potassium. When it is ascertained that all the iodide is dissolved, by examining the opposite side of the plate, it is rinsed in plenty of water, dried and varnished.

Such are the manipulations of a method which is invariably successful. It has been surprising to me that the rosin dry process has not been more generally adopted; and I conclude the reason to be the difficulty in arriving at the most suitable proportions. That difficulty I feel happy in having solved, and if the details given above contribute to the success of other operators, I shall congratulate myself upon having published them.—*Cosmos.*

Scientific Gossip.

Photographers who are accustomed to employ the term "pure" in connection with their chemicals, and who fancy that that word stands for a property which is not difficult to secure, and when secured in any substance may be preserved indefinitely, will read with interest an account of the difficulties met with by one of the first analytical chemists in Europe, M. Stas, in his endeavour to procure pure chemicals for certain researches on the atomic weights.

In our chapters on "Photographic Chemicals" we have already treated of some of these bodies before, and have given the means best known at the time for procuring them in a state of purity. These experiments of M. Stas' will show that *chemical* purity even surpasses the high standard demanded for photographic purity, and may perhaps serve to urge amateurs on to seek a still higher standard than they are now in the habit of employing. In chemistry there is no such thing as absolute purity; the utmost that we can ever hope to effect is to reduce the contaminating elements down to the minimum; but what that minimum should be must depend upon the requirements of the the individual operator. Doubtless, when the science becomes more refined in its accuracy, and when, as must some day be the case, processes of almost fabulous rapidity and sensitiveness are in constant use, as superior in quickness to collodion as that is to calotype, it will be found that the great reason why perfection was not sooner attained was that we only took account of impurities in our chemicals when they amounted to thousandths and neglected the millionths.

We have already given the most approved methods of obtaining water and the common acids in a high state of chemical purity. At the time we wrote the processes given were the best known; it can give no better idea of the rapid strides which chemical science is now making than to compare the plans formerly recommended with those now adopted by M. Stas. By his researches he has raised the standard of purity in all the laboratories in Europe, and photographers as well as chemists cannot fail to benefit largely by the improved appliances placed at the service of manufacturers. Speaking of water—that first necessary for the photographer—the following plan is necessary to obtain it in a state of purity. It must be twice distilled, the second time being condensed in a platinum refrigerator, and not allowing the liquid to boil violently. When freshly prepared, this yields a liquid which, upon evaporation or dryness in a platinum vessel, either covered or exposed to the air, leaves no residue whatever. This then is the test for distilled water; and for our own part we must admit that we have never yet found any water of commerce that would stand it. This same distilled water, however, after having been kept for some days in a platinum or porcelain vessel, and then evaporated, leaves a very appreciable brownish yellow residue, which burns away completely at a red heat in the air. Distilled water, which would volatilise completely in a covered or open vessel, if acidulated with pure hydrochloric or nitric acid, then leaves when evaporated in a covered or open vessel, a yellow residue. It is therefore proved that ordinary distilled water, even if prepared with all possible care, contains volatile organic matter, which after a certain time becomes spontaneously fixed, and becomes instantly so under the influence of nitric or hydrochloric acid.

It is therefore necessary, if the presence of this organic matter in distilled water is objectionable, (and in photography it is certainly most hurtful,) to pass the vapour at the first distillation through a long copper tube, luted with clay and sand, completely filled with oxidised copper turnings, bent in a zig-zag manner, and heated to a full red heat in a furnace. The water resulting from the condensation of this vapour must be distilled a second time with care, and condensed in a platinum refrigerator. This refrigerator is a long platinum tube, soldered with gold, bent in the form of a syphon, and employed in a manufactory to condense sulphuric acid vapours. Water prepared in this manner may really be called pure: after keeping, or immediately, if submitted to evaporation by itself, or after acidulating with nitric acid, always volatilizes in a covered vessel, without leaving any trace of residue.

Pure water having been obtained, the next step was to get pure hydrochloric acid. This was effected by taking the so-called pure acid of commerce, and boiling it, conducting the vapour by means of a Bohemian glass tube, into some of the previously purified water, contained in a covered platinum vessel. The acid thus obtained can be evaporated to dryness in a platinum retort, without leaving the least trace of residue. If, however, the evaporation be effected in an open vessel, the matters floating about in the air are always fixed by the acid, and then the purest article will leave a yellow residue, in which iron is often found. It is thus seen that the method for ascertaining the purity of hydrochloric acid, viz. evaporating to dryness in an open vessel, is fallacious; and will always show the presence of impurities, whether pre-existing in the acid or not.

The next acid which M. Stas attempted to procure pure, was nitric acid. This was a matter of more difficulty. The commercial "pure" acid, sp. gr. 1·500 was distilled until the condensed product contained no chlorine. To test for this element, the acid must be previously mixed with four or five times its volume of water. Indeed an acid at its maximum of concentration can contain traces of chlorine without being rendered turbid by nitrate of silver solution. This is easily seen by adding nitrate of silver, to pure water and then mixing a few drops of this solution with strong nitric acid, which is known to contain traces of chlorine. The acid will remain clear, but by adding to it the remainder of the water, the liquid will be seen to be decidedly turbid. When the absence of chlorine in the distilled acid is clearly ascertained, it is to be twice re-distilled, and preserved from the air in well-stoppered glass bottles. This acid even now leaves a trace of residue, to remove which it is necessary to distil it a third time in a large platinum retort, employing a globe of Bohemian glass as a receiver. Moreover, this acid must always be used immediately after its preparation. As a test of purity, a whole litre can be evaporated down to dryness in a platinum retort, without leaving the slightest residue, provided its vapour is kept from all contact with air. In evaporating acids down with free access of air there is always left a more or less appreciable yellow residue, just as we have seen in the case of water acidulated with acids. M. Stas concludes from this that the impurities found by most chemists in acids, do not always pre-exist there, but have been communicated to them by the air having free access to them during the assay. He, therefore, recommends in testing acids, that the assays should always be performed in platinum retorts fitted tightly to Bohemian glass receivers (common glass being acted on by acids as well as by pure water); and that all evaporations of acid liquids should be performed in close vessels so as to prevent the air from penetrating into the interior of the vessel containing the liquid which is undergoing evaporation.

A specimen of glass has been forwarded to us by W. G. G. for examination in the spectroscope. It is an orange glass, rather dark, but not so deep as some which we have met with. It cuts off the rays above the line F very perfectly, and almost completely the rays between E and F. It is, therefore, quite opaque to the blue, indigo, violet, and invisible rays (those which act upon iodide of silver) and almost opaque to the higher green rays to which bromide of silver is sensitive in addition to the above. This glass is so nearly perfect that we should not hesitate to glaze our dark-room with it provided no great amount of light fell upon it.

DEVELOPING WITHOUT FREE NITRATE OF SILVER.

BY G. WHARTON SIMPSON.*

It has been a commonly received opinion amongst the majority of photographers, that the presence of free nitrate of silver was a necessary condition to the development of the latent image produced by light on the sensitive collodion plate. Theoretically, it has been held by some, that the presence of any two of the generally used salts of silver, would ensure the conditions necessary to development; but practically, the presence of the free nitrate has generally been regarded as an indispensable condition both in dry and wet processes.

I wish to call attention to a method of development likely to prove of the greatest possible importance in dry-plate photography, which involves the negation of this condition. My attention was first called to the subject in a communication received from Mr. Mudd, whose collodio-albumen pictures are generally acknowledged to be amongst the very finest specimens of dry-plate photography.

It is only right to add, that Mr. Mudd gives the *entire* credit of the suggestion to his assistant Mr. Wardley. The method of development referred to, consists in the application to the exposed collodio-albumen plate of a solution of pyrogallic acid, without either acetic or citric acid, and without any nitrate of silver; the strength mentioned by Mr. Mudd, is two or three grains to the ounce, but I believe the strength for this purpose is comparatively unimportant.

Contrary to what might be expected, the image rapidly develops very perfectly. When all the detail is fully out, the usual developing solution of pyrogallic acid, and citric acid, with a little nitrate of silver solution, is applied and the desired amount of intensity by this means obtained.

Having been struck with the manifest advantages of such a process, and having subsequently an opportunity of witnessing its simplicity and convenience in Mr. Mudd's hands, I was anxious to ascertain whether it was equally applicable to other dry processes. I have accordingly tried it on dry plates, by a variety of processes besides the collodio-albumen. I have tried it on Fothergill plates prepared by different persons; on tannin plates, and on Dr. Hill Norris's extra sensitive dry plates.

Mr. Mudd, in a conversation I had with him on the subject, expressed an opinion that notwithstanding his plates received a very thorough washing after their final sensitizing, some trace of free nitrate must be left, sufficient to aid development. I was led in my experiments with the plate referred—especially in the Dr. Hill Norris plates, which it is understood are entirely deprived of free nitrate of silver—to believe that development might be effected without any free nitrate whatever. In every instance I obtained an image more or less perfect on the application of pyrogallic acid alone. In order to test the matter still further, I excited a plate and proceeded very carefully to remove all free silver. I washed it in several changes of common water, and finally placed it in a dish containing a strong solution of chloride of ammonium, leaving it there for about a quarter of an hour. I now washed it again very thoroughly, using several quarts of water. Having taken every pains by washing, and the use of chloride to remove all free nitrate of silver, I exposed the plate and then developed with the solution of pyrogallic acid with silver or acetic acid. In a minute or two a very perfect, but very thin image was fully developed. On applying the usual developer and silver, the image intensified satisfactorily. I think from this it may be fairly assumed that the principle is applicable to dry plates prepared by any process, no matter what pains may have been used to remove all traces of free nitrate. The collodion I used was prepared with a bromide as well as an iodide. What the result would be with a simply iodized collodion I have not had time to try; neither have I had an opportunity of trying the salts of iron as a developer under the same circumstances.

In referring to the advantages of such a process, I think they must be very apparent. One of the most common faults of dry plate negatives is hardness: this arises doubtless from two causes; the first being a common tendency, especially in beginners, to under-expose their plates. But by far the most fruitful cause is the difficulty of determining, under all circumstances, the exact amount of silver to be added to the developer, so as to secure the proper harmony between the process of development in the film, and that reduction of silver upon it, by which intensity is obtained. If it so happen that prolonged development is necessary to bring out all the detail, it unfortunately happens that accumulation of deposit on the high lights, burying all the delicate half-tone immediately adjoining them, is at the same time going forward. If the development be stopped in time to save the lights and the lighter shadows, it frequently happens that much of the detail in the darker parts of the shadows is not brought out. The issue in either case is the absence of that delicacy, softness, and harmony of detail, necessary to constitute a good picture.

In the process I have been describing, development proper is effected before the accumulation of intensity begins; the attention is devoted to one thing at a time, and facility afforded for having each part of the process under complete control. The value of the principle, or at least a partial application of it, is essentially recognised by Major Russell, who makes every provision, in his instructions for the tannin process, for the use of a very small quantity of silver until the image is fully out, and the use of a larger portion to give density; but in no case that I know of, before Mr. Mudd's communication, was the possibility and value of developing without any addition of silver, hinted at.

I may add a word or two in regard to the use of hot developing solutions. How far these can be used with advantage in any process except the albumen or collodio-albumen, I cannot say. In regard to its value with the latter, I can speak in the highest terms. In some cases where I have used it, perfectly detailed pictures have been secured with one-fourth of the exposure which would have been otherwise necessary. The mode in which I applied the heat was simply by using hot water first to moisten the plate, and then applying a hot solution of pyrogallic acid without free silver or acid, until all the detail appeared, and then intensifying with the usual developer and silver without heat. As one of the most satisfactory illustrations of the principle, I may call attention to some of Mr. Mudd's recent pictures, which I have present. In one picture, 11 + 9, you will see natural clouds perfectly secured. This was taken on a collodio-albumen plate, with a lens of fourteen inches focus, and a half-inch stop, in thirty seconds.

My especial object is to call the attention of dry plate photographers, of whom, I know, we have many belonging to this society, to this method, so that its applicability to their various processes may be fairly tested. If it prove as useful as I hope, I think it will be hailed by all as a most decided step in the right direction.

A FEW NOTES ON DRY PLATE PROCESSES AT HOME AND ABROAD.

BY W. J. C. MOENS.*

I think it is pretty generally admitted that all dry-plate processes are more or less uncertain in their results. I do

* Read at the meeting of the North London Photographic Association, on the evening of Wednesday, October 23, 1861.

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not mean by this to say that good pictures cannot be taken, even by the most unpopular of them; but the failures which even the most careful photographer is sure to meet with from time to time, always causes him to look with great anxiety to the period when he shall develop the plates which he has exposed with so much care and trouble, and on the success of which he probably has looked forward to for months. This is taking the case of amateurs, with professionals it is even worse, they hardly dare to leave an order to the uncertainty of a dry plate. The effect of this is that dry photography has gradually been deserted by most of its former adherents, for the simple reason that they cannot afford to lose a large per centage of their exposures. I cannot help thinking that the chief cause of most of their failures, which commence at stains and end at blisters, is the humidity of our climate, which causes the plates to be more or less damp from the time of cleaning them till they are developed. In France and Italy, where wet collodion is the exception and dry plates are the rule, you do not find these failures: there, especially in Italy, the air, generally speaking, is so dry that gelatine takes the place of our gum and resin varnishes.

Simple albumen and collodio-albumen are the two dry processes most generally followed. Those splendid views of the French Cathedral, the ruins of ancient Rome, and the statues in the various museums, are nearly all taken by the former. Collodio-albumen is more used for stereographs. There is one thing we must remember in speaking of our neighbours' use of dry-plates: their views are almost without exception, architectural; trees are studiously avoided, and the skies painted out; all which makes their work more easy. I purpose now to give you a few hints I picked up from French, Italian, and German photographers, as regards their method of working these two processes; generally speaking, our brethren abroad make the greatest mysteries of the simplest matters, and are very far from being communicative.

They are very particular in drying, with heat, their plates before coating them; neglecting to do this is the chief reason of blisters, and is a precaution which should never be neglected; very often, instead of mixing an iodide with the albumen, they subject the plate to the fumes of iodine. The large plates are coated by spinning the plate, fixed on a holder made for the purpose, and pouring the albumen on the centre, it soon reaches every corner, and the excess is driven off by the motion imparted to the plate. It is carefully dried in a horizontal position, with a board between each plate. The nitrate baths are generally flat trays of gutta-percha, thereby avoiding the enormous vertical bath that would be necessary for the large plates used.

The development is effected by gallic acid, and conducted as follows:—The plate is levelled on a stand, and a saturated solution of gallic acid, a *few days old*, is poured on, and spread over by means of a piece of clean blotting-paper. This is left on for a few minutes, in order to thoroughly moisten the film, then poured off, and an equal quantity of nitrate of silver, of from fifteen to twenty grains to the ounce, spread over in the same manner, this quickly brings out all the detail, when the silver solution is poured off into the gallic acid first used, this is found desirable in order to obtain the required density, taking care not to make them too thick. This is a powerful, safe, and quick method of development, and you can attend to several plates at the same time. Should a plate be under-exposed, the flame of a spirit lamp, carefully passed backwards and forwards under the plate, will often aid the required details to make their appearance, it is very necessary to have the developing glasses very clean each time.

I will now give the details of a collodio-albumen process used by Mr. Schartzchild, a celebrated German photographer I met at Palermo, *he* took quite a pleasure in explaining it. And not only explaining, for he went through the whole preparation and development of the plates in my presence, in order that he might be thoroughly understood. I saw a great number of his negatives, and they were all first-class: he said he seldom or ever had a failure. Most of his pictures were on glasses about seven by six and a-half inches, so as to allow of two negatives being taken of each subject. I will now give the formula:—

The plate is first coated with old collodion, containing a little free iodine, and sensitized in a neutral bath of nitrate of silver, about twenty-five grains to the ounce; it is then washed in two or three changes of distilled water, and drained; then carefully covered in one wave with the following solution of albumen, which is run off, and then covered again for about half-a-minute with fresh solution, when it is reared up to dry thoroughly:—

Albumen	4 ounces.
Water	½ ounce.
Iodide of potassium	24 grains.
Gum arabic	30 ,,
Ammonia	45 minims.

The plates in this condition may be stored for use. When wanted they are re-sensitized in an aceto-nitrate bath—

Silver	1 ounce	Saturated with iodide of potassium before adding the acetic acid—
Water	10 ounces	
Acetic acid...	1 ounce	

and wash as before. The exposure in sunshine is about two minutes for stereo negatives, and developed in the same way as the albumen plates; clear with hypo, for cyanide is apt to raise the film in wrinkles. I think that a bromide and chloride added to the albumen would render the plate more sensitive to dark green and red rays.

I obtained some very good pictures when abroad by this process, but have not tried it since I returned, always using wet collodion in preference; but I can strongly recommend it to lovers of dry plates, having seen magnificent pictures taken by it in Egypt, Turkey, Syria, and all the southern countries of Europe. The method of using gallic acid as a rapid developer is, I believe, novel here. I have seen several pictures treated so, and with great success.

Critical Notices.

A MANUAL OF ARTISTIC COLOURING AS APPLIED TO PHOTOGRAPHS. A Practical Guide to Artists and Photographers. By Alfred H. Wall. London: Thomas Piper, Photographic News Office.

Perhaps we cannot do better at the outset of a notice of this work than quote its title at length, in order to furnish some idea of its comprehensive purpose and character. It purports to be "A Manual of Artistic Colouring as Applied to Photographs: a Practical Guide to Artists and Photographers. Containing clear, simple, and complete instructions for colouring photographs on glass, paper, ivory, and canvas, with crayon, powder, oil and water colours; with chapters on the proper lighting, posing, and artistic treatment generally of photographic portraits; and on colouring photographic landscapes." Until photographs can be produced in natural colours—if ever that desirable but improbable consummation be reached—the aid of the painter must be in demand in order to give to portraits their full value as likenesses, and endow them with that charm of colour which Opie so beautifully styles "the sunshine of art, which clothes poverty in smiles, and renders the prospect of barrenness itself agreeable, while it heightens the interest and doubles the charms of beauty." It can scarcely be necessary, we apprehend, to attempt for one moment to enforce the importance and value of colour in any branch of pictorial art, and pre-eminently in portraiture. It is a thing generally at once admitted. The universal love of colour at once proves its importance as a pictorial element. The first proof given by the uncultured savage of his perception of the beautiful is manifested in his appreciation of colour. The last effort of the most highly cultivated painter is to excel in colour. We have heard some exclaim, it is true, that they would prefer a good uncoloured photograph to a bad coloured one, but that is simply an argument for the selection of goodness in preference to badness, and, we apprehend that the most vehement admirers of the monochrome, in choosing between a coloured and uncoloured specimen, each of equal excellence in its kind, would unhesitatingly select that in which beauty of colour was added to truth of form.

Presuming, then, that the value and importance of colour are admitted, we have simply to add that this is one of the very best books yet offered to the amateur or professional colourist. Several manuals of photographic colouring have already been issued, and some of them possessing much excellence; but none of them possessed such a claim to comprehensiveness and completeness as the one before us. A portion of the matter appeared in the columns of a contemporary as lessons in colouring. During the progress of these lessons, which spread over a period of nearly two years, the author was in constant communication with the students who were profiting by his lessons. He thus gained an immense fund of experience as to the varied form of difficulties experienced by the tyro in this branch of art, and was thus enabled in re-writing and extending his instruction, to meet the precise wants, and anticipate each stumbling block, which can occur in the practice of future learners. The result is a fulness of detail on points important to the student, scarcely likely under any other circumstances to have been suggested.

Our readers are already very familiar with Mr. Wall as a writer on the art aspects of photography. We here have the opportunity of assuring them that he is even more able with the pencil than the pen; a thoroughly experienced and excellent painter, and that in writing on the colouring of photographs, he is not dealing with the matter theoretically, and offering crude suggestions, but that, like Mr. Guppy, he speaks "from the deep wells of his experience." His teachings are those of a practical man who has done, and is daily engaged in doing, that of which he writes. The following extract from his introductory chapter will serve at once to illustrate the style, and explain something of the purpose of the book.

"In publishing these instructions I have endeavoured to combine the principle of harmonious colouring with the more mechanical rules, believing that the theory and practice of any art should always travel hand in hand. I have tried to avoid being too technical, and have not been afraid to enter into descriptions and explanations of such simple matters as are generally left unexplained by writers who, while endeavouring to teach the elements of colouring to those who desire to learn, yet, address their readers as if they had mastered all the theories and technicalities of the art, and only required a little of that knowledge which they themselves had gleaned from their own absolute practice.

"Such practitioners of our elegant arts as have never before thought much on the subject of photographic colouring will, perhaps, be surprised to find the amount of artistic culture and knowledge essential to its higher order of excellence; and may be induced to look upon this pursuit with more interest and respect, even if they do not direct their own efforts into the same channel. Many amateurs, who vainly endeavour—with their limited opportunities—to grasp the power of representing both form and colour, would do well to take up earnestly the study of the latter, leaving the former to the unerring fidelity of the camera, as used either by themselves or by some *artistic* photographer. The world of colouring is full of loveliness and poetry, and opens a wide field to the ambitious artist; while there is nothing more illegitimate in painting upon a good photograph than there was in the practice of Leonardo da Vinci, Rubens, Titian, Raphael, Guido, Fra Botelemo, and numerous other eminent masters, who painted upon the abozzo, or sketch in dead colour, which, to all intents and purposes, was neither more nor less than a warm-toned photograph.

"Unfortunately, photographic colouring has, to sadly too great an extent, fallen into the hands of mechanical daubers, employed because they work cheaply, and "yclept *print colourers*;" whose gaudy inartistic colouring, and crude, raw, and hard style has brought the art into no little disrepute; by which, also, it has been sometimes most unfairly judged. The technical phrase for such "colourists" (?) is "paper-stainers." They are the greatest enemies both to photography and photographic colouring; for of this I am sure, directly any art becomes degraded in public estimation, it speedily sinks even below the level assigned to it.

"Coloured photographs occupy an undeservedly questionable situation: the artist curls his lip at them, because, as *he* says, they are not paintings; and the photographer sneers at them, because, as *he* says, they are not photographs. They are peremptorily denied admittance to galleries of paintings, and it is continuously and frequently urged that they should not be admitted to photographic exhibitions. Why, then, is this poor art to be an outcast among its brethren, unacknowledged and denounced by both artists and photographers?

"The photographer admits the beauty of colour in a painting, and admires it as warmly as need be. The artist admits the truthfulness of the photograph, and admires its wondrous delicacy of detail, faithfulness of drawing, and perfection of chiaroscuro just as warmly. Why then, should an art which combines the truth of the one with the loveliness of the other, be thus unsparingly denounced by these two important classes.

"Unity is strength, and the beautiful can have no better mate than the truthful. Let the scientific man of the camera, and the tasteful son of the palette, throw aside all their childish jealousies, and combine their efforts for the production of works valuable, both for fidelity to nature and for artistic merit. The best interests of photography are served by advocating its union with art, in demanding for it a much higher standard of worth than it can ever claim as a simple mechanical acquirement, calling for no greater intellectual effort than that implied by carefulness and manipulatory skill; to which condition there are those who now labour, mischievously, or ignorantly, to reduce it.

"To those who are desirous of adopting photographic colouring as a profession, I would urge the following considerations:—

"1st. The market is full of inferior colourists, who jostle and elbow each other at every turn; and these are working at such absurdly low prices that a decent livelihood is, for such, almost out of the question.

"2nd. Beware of a class of advertising quacks, who pretend to teach the art perfectly in four or six lessons. Several young persons of either sex, anxious to secure a genteel if humble livelihood, have to my personal knowledge been induced by such deceptive advertisements to expend their little all in procuring materials and lessons, and in supporting themselves while studying only to find, at the expiration of the lessons, that, while quite unable to earn a shilling by the information thus acquired, and without means of support, they were placed at the mercy of their friends and acquaintances, or of the cold hard world. These contemptible quacks may, or may not, contemplate such serious consequences; but I speak feelingly, knowing how, in one case, a most respectable young lady was thus victimized, and plunged into the most terrible dangers and difficulties.

"3rd. When practising the art professionally, avoid an error which has induced some of my professional acquaintances to tease me with remonstrances and croakings of a very illiberal and ungenerous nature during the progress of this work. Such information and instructions as mine do not tend to decrease the value of a profession by increasing the number of its professors; but, by improving the judgment and elevating the standard of excellence among photographers, really serves the profession, by driving from the field the inferior colourists, now so extensively employed, and increasing the demand for real artistic excellence. The most talented colourist will labour in vain if his patrons are not qualified to appreciate his powers.

"To show both photographers and colourists the advantage of earnest study, and the acquirement of real excellence; to instruct so that the humblest may acquire a power proportionate to his or her ability and perseverance, and to raise my art in the estimation of as large a circle of readers as I may have the good fortune to command, constitute my chief aim in writing these pages."

In conclusion, we cannot forbear a word or two on the "getting up" of the work. It is richly bound in mauve-coloured cloth, gilt, bevelled boards, and gilt edges, admirably printed on excellent paper, and altogether the most handsomely got-up book which has yet been issued in connection with any branch of the photographic art.

Photographic Tourist.

MY FIRST PHOTOGRAPHIC TOUR.*

Mere written words cannot describe the deep-felt, earnest gratitude with which our full hearts thanked Providence for the timely aid afforded in the sale of this picture; it came like a stout cable to the desperate grip of the drowning; like a sudden restoration of healthy life to the bed-ridden sick, or a broad strong shield thrust swiftly between us and a descending death-blow.

Leaving Chelmsford, the last memories we carried away from this little town, were those of its races. Great was the bustle, extensive indeed the preparations, and by no means small the dignified importance with which the Chelmsfordian natives ushered in this great event. All the previous day a long panorama of travelling shows, conjurers, gipsies, dancing girls, musicians, performing dogs, &c., came passing through the place, and towards evening an immense sensation was created by the advent of two short sturdy-limbed men, with wen-like joints, in pink fleshings, and scanty, well-worn velvet trunks, heavily bespangled, having bracelets to match, who rode sternly in with folded arms upon two tame "trained steeds," arrayed in theatrical finery as worn and shabby as that of their wonderful masters. But these were only shadows to the coming event of the morrow, when Sunday attire made glad the weekday sun, when every vehicle of every kind was furbished or mended up for use or hire, when small but majestic, scrupulously clean, and brightly smart jockeys were visible, the admired of all beholders, smiling condescendingly in conversation with the great, but not above bestowing a monosyllable or two upon the awe-hushed, gaping small; and when coach after coach-load of excited sport-seekers were borne in clouds of dust from the town amidst the wild hurraying of the frantic juveniles, until the last having disappeared silence again reigned supreme, and the poor little place seemed even more lonely and deserted than ever. But towards evening back again came all the uproarious noise, and all the excited crowd, with the addition of brass bands, and barrel organs, and violins, and singing and shouting, and screaming, &c., until the inns grew full and overflowed with drunken revellers, for whose coppers the home-made niggers banged and twanged, and rattled and jingled, and the shabby touter outside the patched and tattered circular booth of the equestrians bawled, hoarsely, "Hi! hi! hi! hi! this way! this way! to the riders! the riders! hi! hi! hi! hi!" and we, in the midst of all, bade all adieu, and went our way to Colchester.

We started for a stroll through this proverbially loyal town the morning after our arrival therein, and I was first pleased to see the numerous picturesque old houses, with their high gable roofs, projecting stories and uncovered timbers. How strangely familiar—even when they are something quite new to our eyes—these old houses always appear; they come to us like good old musical airs, old-fashioned pieces of furniture, or any other things of ancient days, which judged by ordinary reasoning, should be novel and strange, but which are, nevertheless, so mysteriously homely and familiar. From some such cause, this old town being full of remnants of the past, seemed like an old friend long neglected, rather than a new one never seen before.

I was next attracted by the novelty presented in a lowly little, old church, which, thrusting a clock out over the pavement of the High-street, from a stumpy, ivy-grown, dwarf of a tower, stood with its one half in complete ruin. This, I found, was called St. Nicholas, and the portion in ruin had fallen many years ago, and had been left ever since just as it then appeared, save that the creeping ivy had gradually cloaked its crumbling walls, and tall mocking weeds now flaunted it bravely above their roofless heads.* Turning round by this relic, and bearing to the left, I was soon afterwards betrayed into an exclamation of delight by seeing, close beside the shabby, ill-supported theatre, the grand old picturesque ruins of some rare old priory, called, as I soon learned, St. Botolph's, or, as my informant said, "St. Bulph's." This is a great treat for the artist or architectural antiquary. The massive remnants of the once stately and richly decorated walls stand rugged and rock-like, half clothed in luxurious ivy wreaths, and bearing on their broad tops a thick crop of tall, waving grasses, and gracefully bending weeds; the shattered pillars rear themselves grimly against Time, the conqueror, and perish slowly but unshrinkingly like warriors disdaining flight; while the broken and crumbling relics of the ancient sculptor's chisel, showing here and there in defaced and battered fragments, now seem far more closely allied to nature than to art. I got a capital view, some few days after, of the ruins from a post near the iron gate by which you obtain admittance to inspect them, obtaining, in my picture, the elaborately decorated gateway of the once magnificent west front, and the tall, circular arched pillars at the sides. The building dates from the reign of Henry the First, was shorn of its importance by the Reformation, and fell, with so many other things of joy and beauty, before the morbid passions of the strong red-handed Puritans during that that terrible Civil War, in which this staunch old town displayed so well its—let me see—what shall we say? its unswerving loyalty and honest truth? or, its stupid prejudices and obstinate bigotry? Well, perhaps the age is not yet old enough to decide. But we are quite old enough to denounce the fanaticism which could thus destroy the records of our country's earliest and noblest aspirations, and lay in dust so many of the noblest works of that sweetest nurse and handmaid of all true religion—Art. Oh! Fanaticism and Bigotry, how have ye cursed the lands and their inhabitants, and what deadly instinctive enemies to Beauty have ye ever been, piling the most costly works of the Brush, the Chisel, and the Pen on one huge funeral pyre, as at Florence, battering down the stately fabrics raised by glowing reverence and love, as here in Colchester, or sternly denouncing the Drama, Music, and the Fine Arts in our own Ebenezer Tabernacles and Sectarian Meeting-houses.

My next point of interest was "The Castle," it stands to the north of the High Street, close behind the houses, and a sturdy old stronghold has it proved. Notwithstanding the power of increasing and advancing years, the assaults of war, and the attempts of those who were to it even stronger foes, who wanted the ground on which it stands to serve some meaner purpose, it still remains, obstinately defiant of both man and time. Strange tales of wild daring and frantic strife could these rugged walls unfold, of the havoc and destruction with which it was surrounded, when victorious Fairfax came at the head of his parliamentary army, and fumed, and chafed in spiteful bitterness, and futile rage about its strong towers for eleven tedious weeks: again and again repeating the desperate assault, and again and again retiring, baffled, and despairing from its well-defended flinty barriers. The dauntless loyalists surrendered at the expiration of that time, but not until the sick, weary, hollow-cheeked, and leaden-eyed defenders were completely worn out, and had no longer the smallest scrap of their jealously-hoarded food, nor cat, nor dog, nor horse, nor any dead or living thing which man could eat for life, remaining in their reach. I was never more interested than in reading the account of this protracted siege, and afterwards used to look with no small degree of sadness and interest, upon two small white stones beside the castle, which mark, it is said, the spots on which the king's good men and true—Sir Charles Lucas and Sir George Lisle—were shot to death immediately after surrendering, not to the Puritans, but to even a more cruel foe, starvation. The mound on which

* Continued from page 495.

† It makes a very good picture, and my daguerreotype of it never fails to awaken interest in all who see it.

the castle stands is said to be of Roman origin, and on the loftiest tower—in the place doubtless, where once floated the proudly defiant banner of the dethroned king—a goodly tree is growing. I secured, before leaving the town, two camera pictures of the castle, but was unable to get far enough from it to secure such a view as omitting a too conspicuous cabbage garden, I afterwards got with my pencil. A very picturesque effect, however, would result from taking it with your camera, stationed at the commencement of the lane which runs behind the castle, taking in the cottages on one side, and the trees on the other. I have since seen several paintings of the castle in which this view has been selected by the artists.

But the town of Colchester is a rich mine of interesting objects, and being only a short distance—about fifty miles—from London, can be easily reached by our metropolitan photographers; in fact, I do not know a place in which a more pleasing variety of views can be secured. No end of picturesque and beautiful spots exist in the town's immediate vicinity, and in the town itself a number of fine ruins, ancient churches, and old fashioned houses, will serve to fill worthily no small number of plates. St. John's Abbey gate is well worth taking among the rest.

LECTURE ON PHOTOGRAPHY.

BY CHARLES HEISH, F.C.S.

A LECTURE on photography was delivered on the evening of Tuesday the 22nd, at the Greenwich Literary and Scientific Institution, by C. Heish, Esq. The lecturer began by stating that it was not his intention to go into the manipulatory details of any particular process, but rather to endeavour to point out as far as they were known, the principles involved in the various processes, and to show how far the actions were strictly due to light, and how far to other and more ordinary chemical actions.

He then proceeded to point out that all chemical actions were divisible into two classes, one the combining of bodies together to form more complex substances, and the other, the decomposing of complex bodies into the more simple ones of which they were composed. The chemical action of light was no exception to this rule, it caused combinations, as an instance of which he mentioned the combining of chlorine and hydrogen when exposed to light, it caused decompositions, of which the blackening of salts of silver in light was an example, consisting as it did of the separation of the silver, wholly or partially from the substance with which it was combined in the salt.

He then said he thought he should best show how these principles had been applied to the production of pictures by the agency of light, by passing in review the various photographic processes, beginning with the first recorded observation on the action of light on chloride of silver by the alchemists. He next called attention to the observation of Scheele, that silver salts blackened more rapidly in the violet rays of the spectrum than in any other part, and having thrown a beam of electric light through a prism on to a white screen, pointed out the various parts of the spectrum, with its point of greatest action. He then gave a brief description of the various photographic processes previous to the discovery of Daguerre, exhibiting the production of a copy of a piece of black lace on paper prepared with chloride of silver, by means of the electric lamp. He then spoke of the Daguerreotype as the opening of a new era in photography, as it introduced the principle of combining the reducing action of light with that of ordinary chemical reducing agents. He then proceeded to show what was meant by a reducing action, taking as the most simple instance, the action of hydrogen on oxide of silver, and showing that though hydrogen might be passed over oxide of silver in the cold without producing any effect, that a slight elevation of temperature caused the hydrogen to combine with the oxygen, producing water, and leaving metallic silver in the form of a brilliant white powder. He then showed that one metal might act as a reducing agent to another, an instance of which was the action of mercury on nitrate in silver, in the production of the well-known "arbor Dianœ." Here was a simple action of substitution, the mercury combining with the nitric acid, and liberating the silver without any other agency than that of superior chemical affinity. In the daguerreotype plate the action was so far different, that the mercury could not reduce the iodide of silver until it had been acted on by light, that agent playing the same part with iodide of silver, in causing it to give up its iodine to mercury, that the heat did with oxide of silver, in causing it to give up its oxygen to hydrogen. He noticed that at first the white parts of a daguerreotype were thought to consist of globules of mercury, but subsequent investigation had shewn that they mainly consisted of reduced silver, the greater part of the mercury employed being found in the form of iodide in the fixing solution.

He then gave an account of the experiments of Rev. J. B. Reade and Mr. Talbot with gallic acid, which ended in the invention of the calotype process, and described the action of both gallic and pyrogallic acid as a reducing action, similar to that of the mercury on a Daguerreotype plate; indeed, by proper management, a Daguerreotype might be developed with gallic acid and a paper picture with mercury. He showed the reducing effect of pyrogallic acid in a solution of nitrate of silver, producing at once a black deposit of silver, which was, however, not the case with the iodide till it had been exposed to light. He pointed out the similarity of this action with that of the hydrogen in the tube of oxide of silver; indeed, the pyrogallic acid owed its power of reduction mainly to the large quantity of loosely combined hydrogen which it contained; and he showed that the black colour of the deposit was simply owing to its state of agregation, as a burnisher it became like polished silver. After describing the albumen and collodion processes, he proceeded to remark on the introduction of bromide of silver, both in Daguerreotype or other processes, and explained that its goo d effect was due to the fact, that while iodide of silver was affected only in the violet and blue parts of the spectrum. Bromide was also affected by the green and even slightly by the yellow. He then adverted to the fact of the action on iodide of silver being principally caused by the invisible rays beyond the spectrum, and exhibited a protograph of the spectrum on the screen in which the limbs of the visible spectrum were marked by lines drawn on the plate. He then said that he thought photographers had been too much led away by the superior sensibility of iodide of silver to these extra spectral rays, to neglect the study of other salts, forgetting that it is a representation of the *visible* rays that is really wanted. He then adverted to the fact that according to Senebin's old experiments, chloride of silver was affected by every part of the spectrum, being blackened as much in 20 minutes by the red rays as by the violet in 15 seconds; as far as he knew, no amount of exposure would make the red rays affect iodide of silver. To this fact he attributed the good which he himself had years ago pointed out to arise from a duo admixture of chloride with iodide and bromide in taking objects of various colours. He then remarked that the only successful attempt to produce the natural colours by photography had been that of Becquerel, who employed a peculiarly prepared chloride of silver, and had produced brilliantly coloured copies of the solar spectrum. The exposure required was too long to admit of this procsss being applied to ordinary photography; but if ever coloured photographs are to be produced, it must be by the use of substances applied by the coloured and not the extra spectral rays.

The difference between positive and negative photographs was exhibited by throwing on the screen enlarged images from to explain glass negatives and transparent positives.

In conclusion, the lecturer said he had intended to speak of positive printing and toning, but having already detained his auditors nearly two hours it was impossible; but he might remark that the same principles which he had been endeavouring to explain were involved in both these processes.

He would now only ask them to examine the specimens on the wall behind him. Those illustrating calotype being by Mr Turner, and those on wax paper by himself, while, for the extremely beautiful specimens of wet collodion landscapes, he was indebted to his friend Mr. Heath.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this association was held at Myddelton Hall on the evening of Wednesday, October 23rd. G. SHADBOLT, Esq., in the chair.

The minutes of a previous meeting having been read and confirmed, Messrs. T. Ross, and T. F. M. Ingall were elected members of the Society.

A letter was read from the Bradford Photographic Society, intimating their intention of holding a Photographic Exhibition, and asking for the co-operation of this society. It was resolved that members be asked to aid, as far as possible, in their individual capacity, the Bradford Exhibition. The North London Society, in its corporate capacity, had not power to do more than express interest in, and approval of, the efforts of the Bradford Society to advance the art.

Mr. G. Wharton Simpson then read a paper on Developing without Free Nitrate of Silver (see p. 518). Some very fine specimens by Mr. Mudd illustrating the method of development were examined, and much admired.

Mr. Seeley remarked that he recently found the image visible in a tannin plate after exposure, but before developing at all. The image became apparent immediately on wetting the plate.

The Chairman remarked that the circumstance was not uncommon with tannin plates where the exposure had been long. It occurred also with plates prepared with honey.

Mr. Seeley thought that a deposit of silver was necessary to form the image.

Mr. Simpson remarked that the reduction of the salts of silver in the film formed the image. The purpose of free nitrate was to give intensity. The circumstance of an image being apparent before developing, sometimes occurred with long exposures in the collodio-albumen process, and in others where any reducing agent was in combination with the silver.

Mr. Seeley thought it would be difficult in hot development to maintain the same temperature all the time of development.

Mr. Simpson said that it was unnecessary. He simply wetted the plate first with hot water, and then applied the hot solution. If that cooled before the detail was out, he applied more. The temperature might be about 150° more or less. How far it would answer in the wet process, or other dry processes, he could not say, as he had only tried it with collodio-albumen plates, from which the surface deposit, it was apt to cause, could be easily removed.

The Chairman observed that the subject of the paper was one of considerable practical importance in connection with dry-plate photography. With regard to the rationale of the matter there were two or three things struck him, which he before made some memoranda regarding, and he might now refer to them. It would be noticed that the preparation of all dry plates secured the presence of organic matter in combination with the silver, and this could be reduced without any development whatever. In the collodio-albumen, and Fothergill, there was albumen, in Major Russell's process, tannin, in Dr. Hill Norris's, gelatine. There was one point in Mr. Simpson's experiments which suggested to his mind that something more was present in the latter than gelatine. The readiness with which an image was formed by the developer without free nitrate, suggested that they were treated with some other form of organic matter prior to being covered with gelatine. It had been suggested that serum of milk was used. Then regarding the next experiment of Mr. Simpson's, in which there where only bromide, iodide, and chloride of silver present. Of course some traces of chloride would be present, however carefully the plate might be washed; and it was well known that the chloride could be reduced, and the same with the bromide. To set the question at rest whether an image could be developed by the reduction of iodide of silver alone, without the presence of any other reducible salt of silver, it would be necessary to prepare a plate with a simply iodized collodion, after exciting, wash it with a solution of an iodide, and after exposing a plate so prepared, endeavour to develop a picture without the presence of another salt of silver.

Mr. Simpson thought this experiment would scarcely meet the case. He had used a chloride to get rid of the free nitrate, because that was the mode usually adopted in dry processes where it was thought desirable to ensure the absence of free nitrate, and he wished to secure the same conditions. He had thought of the use of an iodide; but he did not think the experiment would be a fair one, seeing that many excellent authorities held that iodide of silver alone, or iodide of silver plus an iodide, was insensible to light, and if the plate were insensible to light an image could not, of course, be developed with or without the presence of free nitrate. There was another conclusion drawn by the Chairman from one of the experiments stated in his paper, which perhaps it was desirable to correct. The Dr. Hil Norris plates had not developed readily without free silver, but very tardily, more so than those by any other process. The image appeared very slowly and was of a very thin and feeble character when it did appear, so that there was nothing which necessarily suggested any organic combination with the silver.

The Chairman could give a distinct denial to the idea that iodide of silver was insensitive to light, as he had prepared a plate so, exposed it to light, and obtained a picture.

Mr. Simpson had not himself tried that method with a collodion plate, although he had often tried an analogous experiment with the Daguerreotype plate, in which case he knew the iodide of silver to be capable of receiving an image.* It was, however, commonly held by authorities that iodide of silver alone, or with excess of an iodide was insensitive to light; and as his experiments had not been undertaken with any view to testing moot points of a theoretical character, but with a view to a direct practical bearing on the usual methods of preparing dry plates, he did not think it wise to convert the free nitrate into an iodide.

The Chairman must not be understood to be urging any objection. On the contrary, he thought the subject very important, and the practice highly desirable; but in all these cases it was very desirable not only to obtain a good result, but also to know the cause. The experiment he referred to he had published some years ago, when he was led to the experiment by the advice then given so commonly to expose the iodised calotype paper to sunlight. He had no doubt whatever of the sensibility of iodide of silver. He had indeed on occasion exposed one plate to three or four views. Having for some reason come to a conclusion that the picture on an exposed plate would not be satisfactory, he washed it with a little weak iodized water, which discharged the image, and rendered the plate sensitive to another impression, in the same manner as an exposed Daguerreotype plate was again rendered sensitive by exposure to the fumes of iodine.

Mr. Simpson might add that he had tried other experiments, which, though less conclusive, gave results decidedly opposed to general authority on the subject. Mr. Hardwich, for instance, in the theoretical part of his "Photographic Chemistry," stated the fact emphatically that free nitrate of silver was necessary to development, and suggested as an experiment in proof, that if an excited and exposed collodion plate were washed with distilled water, and then covered with the developing solution, no image would be produced until a little free nitrate were added. He had tried the experiment, and succeeded in obtaining an image, without adding the free nitrate.

The Chairman suggested that probably Mr. Hardwich tried the experiment with pyrogallic acid solution, containing acetic acid, and the restraining influence of the acid was sufficient under the circumstances to prevent development.

Mr. Hill intimated that he had had on one occasion developed without free silver some dry plates which were simply washed and dried without any preservative.

Mr. Simpson might just call attention to the advantages which hot development afforded for securing natural clouds. One of Mr. Mudd's specimens, now before the meeting, illustrated this. When the clouds appeared, the plate was washed, and the foreground forced with the hot solution. The experiment was very successful.

Mr. Moens then read a paper "On Dry Processes at Home and Abroad." (See p. 518.)

Mr. Hughes remarked that he thought he remembered Mr. Ackland mentioning a similar method of development to that referred to by Mr. Moens, in which after the application of pyrogallic acid, the development was continued by the addition of a large excess of silver solution.

The Chairman thought that though this, and the method described by Mr. Simpson appeared the very antipodes of each other; they were really similar in principle. The object was in both cases to bring the developing agent in contact with the smallest quantity of silver.

Mr. Seeley said that at the South Kensington Museum he believed they were in the habit of developing wherever the subject was difficult to bring out, with equal portions of a 1½-grain solution of pyrogallic acid, and of a 30-grain solution of nitrate of silver.

Mr. Hughes remarked, that in this case the extreme was

* We may here add that it is thought by some authorities that the Daguerreotype plate does not present an analogous case to pure iodide of silver when entirely isolated; as the metallic silver in immediate contact with the particles of iodide may play some part in the matter.

certainly obtained, and the maximum of silver was brought into contact with the developing agent.

The CHAIRMAN asked Mr. Moens what part the gum was intended to play which was introduced into the albumen.

Mr. MOENS believed it was thought to attach the film more firmly to the glass.

The CHAIRMAN thought the reverse. Some time ago the addition of sugar to the albumen had been recommended, with the view of making the dessicated albumen more permeable by the developing solution. Perhaps the gum might be supposed to have a similar effect.

Mr. HUGHES remarked, that the method just referred to by the Chairman was that known as the Whipple modificaton.

Mr. SEELEY asked if gum alone could not be used as a preservative, and what were the objections.

Mr. SIMPSON said it could be used, and was much admired by some. It did not keep well however, and was apt to stain and fog. The addition of citric acid in some degree modified these defects.

Mr. HOWE showed a series of negatives, which were described as produced by Mattheson's collodion developed by iron, without any subsequent intensifying.

Mr. HUGHES remarked that the circumstance pointed out as the especial advantage here was, what he should regard as the chief defect. The pre-eminent advantage which iron had as a developing agent over pyrogallic acid, was the fact that by its agency the whole of the detail in a picture could be developed without having obtained at the same time any sensible degree of intensity, thus leaving the negative in a condition to have just such a degree of intensity added, which might be judged desirable. Taking a common sense view of the matter, the operator had, in developing, two distinct objects. His primary object was to secure all the detail in his subject; that done, he had to give such density as might be required for printing. To the change in this respect, which had now become general, might be attributed, he conceived, the superior class of pictures which were now produced, as compared with those common when the processes of development and intensification were conducted in one operation. Wherever that was done, no matter what was the developing agent, there was danger of getting too much density in the high lights when the development was continued long enough to bring out detail in the deep shadows; or on the other hand, if development were stopped when the lights were just right, then there were masses of shadow without detail. There was a choice of evils; in either case the picture suffered. In the old method of pyro development these two processes were always going on at the same moment, and it was most difficult to hit the happy medium desired. The method, now used, of developing with iron, rendered all this easy. He had not been present at the commencement of the meeting, but he had no doubt his friend Simpson would have pointed out to them that Mr. Mudd's method of developing dry plates was based on the same principle, and this would at once explain how it was that his pictures were celebrated for softness and detail, although produced by a process which in other hands was noted for hardness. It was not a new thing to produce a collodion which would readily produce any amount of intensity with iron only; but he thought it a most undesirable thing, as it destroyed the chief end and advantage of iron development.

Mr. HILL asked if Mr. Vernon Heath did not propose a method of developing with pyrogallic acid based on a similar principle. It was somewhat singular that before knowing anything of the subject of Mr. Simpson's paper he, Mr. Hill, had remarked to Mr. Simpson that he thought an excellent plan of obtaining softness would consist in developing without free silver.

Mr. SIMPSON remarked that when Mr. Heath developed with pyrogallic acid, he adopted the principle of diluting the developer as much as possible so as to secure detail first, and intensity after. He now used an iron developer, but it was based on the same principle, and with even superior results.

Mr. HUGHES remarked that the intensity of collodion depended mainly on the character of pyroxyline. He had recently had an opportunity of seeing some of the Parisian operators at work, and they rarely needed to intensify at all; iron alone was sufficient.

Mr. MATTHISON observed that a little, in his case, depended on the especial formula he used for his developing solution. It consisted of 10 grains of iron, 30 drops of acetic acid, and 3 drops of strong ammonia.

Mr. HUGHES remarked that probably acetate of iron would be formed.

Mr. MATTHISON said the same result did not follow if acetate of ammonia were added instead of the acid and ammonia separately.

A MEMBER asked the effect of citric acid in the iron developer.

The CHAIRMAN said it would make development slow if added in any quantity.

Mr. HUGHES said a very small quantity of citric acid was sufficient to retard development with iron very considerably. He had used a 60-grain solution of iron, with a little citric acid, and it required three minutes to bring out a properly exposed plate.

Mr. HILL remarked that nitric acid would have a similar effect.

Mr. HUGHES observed that the result would be very different. Nitric acid would impair density; citric acid did not do that, but it produced a blue colour, which was very deceiving.

The CHAIRMAN showed some very fine instantaneous stereoscopic pictures.

A conversation ensued on the merits of combinations of lenses and single lenses for instantaneous views, in which nothing was established.

Some specimens by the panoramic lens sent by Mr. Ross were shown by Mr. Hill. It was generally thought, that although straight lines were curved in the pictures, the amount of subject gave them great advantages as regards pictorial effect.

A bath and dish of ebonite were shown by Mr. Moens, and considered to have great advantages should the material turn out in all respects suitable for photographic purposes.

Mr. SIMPSON showed "The Lady of Shalott," and "Early Spring," by Mr. H. P. Robinson, both of which were much admired; the landscape being generally regarded as one of the finest results of the camera yet produced.

After the usual votes of thanks the proceedings terminated.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 30th October, 1861.

IT has been a constant source of surprise that amid the anxiety to obtain a really good dry collodion process—one combining certainty of results with quickness of action—that more consideration should not have been given to the suggestions and recommendations of the Abbé Despratz. He investigated the subject in a very rational manner, and published a lucid exposition both of the theory and the practice of dry collodion with the simple addition of common rosin. Probably the reason this modification of collodion has found so little favour lies in the fact of its extreme simplicity. Had the Abbé pompously put forth a complicated formula after the usual model of an apothecary's prescription or a fantastical cook's recipe, his dry collodion process would have made as great a noise in the photographic world as many of those which enjoyed an ephemeral popularity, but which are now consigned to oblivion. Fortunately the Abbé's suggestion can suffer no harm by the indifference exhibited towards it. After all the empirical formulæ have been tried and found wanting, its merits will be duly recognized and acknowledged.

It is just possible, that many who tried the Abbé's formula may have failed in success at the first essay, but had they shown the same perseverance and determination to succeed as exhibited by Mr. Van Loo, of Amsterdam, photographers in search of a practicable "dry process" would have adopted "rosin," and let the nostrums, so much vaunted past times, pass with the indifference they so much merited.

In connection with the subject of "Colour in its Relations to Photography," it must have struck every photographer, when viewing the photographic image received on the ground-glass, that the image appears to possess much more colour than the object itself. This phenomenon is due partly to the *concentration* or *condensation* effected by the reduction in size of the image of the object, and partly to an error in our sense of vision with regard to distance. In the image on the ground-glass, all the various distances of a landscape are represented on a plane surface, by which the eye is enabled to take them in unbiassed by the forms; neutral tints, which in nature are scarcely perceptible or regarded by the ordinary observer, become distinct as patches of colour in the image. In the stereoscope, especially, this phenomenon is strikingly apparent.

Again, when the eyes are brought into an abnormal position, as in looking between the legs, or under the arm, the landscape appears much more vivid in colour. In explanation of this well-known fact, it has been suggested that it is due to an augmented pressure upon the brain, or to the different accommodation of the eye for vertical and horizontal lines; but it is to be considered then, even when in an easy reclining posture, where this pressure on the brain cannot exist, the heightening of tints in the landscape is seen with great distinctness by viewing the inverted image of the scene through a rectangular prism, even if the head be held in its natural position.

The more rational solution of the phenomenon would appear to be intimately connected with our perception or non-perception of distance. In gazing at landscapes, the ordinary habit of most persons, artists excepted, leads them to pay attention to the forms and *distances*, (which alone have a practical value as objects of observation), and to neglect the *colour*, particularly those portions of it which are subdued. If by any means the mind is prevented from dwelling on distance, it is thrown back on the remaining element, colour; then the landscape appears like a mass of beautiful patches of colour, heaped upon each other, and situated more or less in a vertical plane.

A perpendicular position of the eyes reduces very considerably our perception of depth or distance, so that false estimates of it are formed by the eyes in this new situation. With the exception of objects in the foreground, all objects seem to lie not far removed from the same verticel plane.

In normal vision with a single eye, there is certainly, in a binocular sense, no perception of depth, nevertheless, the mind occupies itself with the idea of distance, and if the objects are familiar, there is no augmentation of colour perceived. By inverting the image of the landscape with a rectangular prism, the objects fall into almost one plane, are diminished in apparent magnitude, and the mind, unable to trace distances through this maze, is forced to dwell on the mass of tints presented.

With the erecting or vertical telescope, in proportion as the objects are divested of the idea of solidity or depth, can their more delicate tints be preserved. Objects, which in normal vision seem to us nearly without colour, are best fitted for these observations; a bare pile of stones and dry mud viewed through a telescope, appears often like a richly tinted water-colour drawing.

It would seem probable that if we could add to paintings of landscapes the element of distance, the mind occupied with this would no longer dwell on the richness of the tints. This is confirmed by coloured stereographs of landscapes, which out of the stereoscope seem exaggerated in tint, when placed in the instrument no longer appear too highly coloured.

From these considerations it would appear, that when the mind is engaged with the perception of distance, the *presence* of colour is often overlooked; its *absence* may remain unnoticed from the same cause, for in uncoloured stereographs of objects that are perfectly familiar to the observer, it will sometimes be noticed, that those articles which do not greatly differ in colour from the tint of the photographic paper, are seen in the stereoscope with an approximation to their natural hues; upon withdrawing the slide from the instrument no trace of such tint is perceptible. Objects that are free from lustre, as well-known carpets, answer for this purpose. That this should be the case with the tinted photographic representations of white objects can, of course, be explained in another way.

Speaking of the tannin process of Major Russell, Sig. L. Alivari the eminent Florentine photographic artist, writes to the editor of the *Le Moniteur de la Photographie* the following testimony in its favour:—"It is the only dry collodion process that possesses any merit, and which can replace the Taupenot process by its simplicity and rapidity. I have made several trials of it, against my inclination, for I am rather prejudiced against innovations, and I have obtained excellent results. I do not doubt that the same success will attend the experiments other operators may make with it."

PHOTOGRAPHIC EXCHANGE CLUB.

Dear Sir,—As secretary of the Photographic Exchange Club, I am desirous of relieving your correspondent R. M. from any fear that he, or any other member of the Club, will receive duplicate copies of any print forwarded for exchange, as I certainly consider it part of my duties to prevent such an occurrence, by a method of checking each arrival and dispatch, which has enabled me to make some 300 exchanges, with 20 or 30 different members of the late Stereoscopic Exchange Club, without any difficulty.

Of course, I know nothing of what exchanges have already taken place among the members of the late Stereoscopic Exchange Club, who may likewise belong to the present Club.

The one thing needful to success, is this, that gentlemen will not be content to be passive members of the Club; for example, if one or two energetic members send in their good prints by the half-dozen, from each negative, large and small, it is likely to give the referees some trouble to get rid of them, if the other members don't respond.

I am, dear sir, yours respectfully,

Frank Howard.

Stockwell, Oct. 26th, 1861.

SUNDAY PHOTOGRAPHY.

Sir,—As regards the Sunday question, notwithstanding the letter of "A Doorsman," I contend that it is not by compulsory closing of photographic studios on the Sunday that the "dens" will be got rid of, but by the abolition of "doorsmen" altogether; it is they that keep up the vicious system; it is their importunities that inveigle so many victims into such disreputable places; and we find that those disgraceful scenes, such as have been made the excuse for enveighing against Sunday photography, did not occur on Sunday, but in this, as on another occasion, where the "lady" photographer and her "doorsman" figured in the police report, it was in the ordinary week's business.

Now I contend, that as there are in all large towns (and even so in small ones) many who, from the close application they are forced to give to their business, have no possible time to have a portrait taken except on Sunday, and if such persons do not believe it to be religiously wrong, I maintain that they have a just right to do so; and no compulsory law to prohibit them will convince them to the contrary, but only serve to strengthen their conviction, that such interference is but intolerance which ought to be resisted. I am, sir, your obedient servant,

J. Walter.

Lyme Regis, Oct. 19th, 1861.

Sir,—Although there have been several letters inserted in the pages of the News of late respecting Sunday photography, still I hope you will allow me to give my opinion as to a method of suppressing the Sunday trade in photography,

I think it would tend to abate the nuisance by obtaining the names of photographers who keep open their places of business on Sundays, and inserting their names and addresses in the columns of the News; and should the proposed "London Photographic Sunday closing Association" ever be permanently established, that they should publish the list in the advertising columns of some daily newspaper having a good circulation in every town in England, Scotland, Ireland, and Wales, so that the public may at once see an entire list of all the photographic Sabbath breakers.

Unfortunately, I am one who is shut up amongst the poisonous chemicals on Sundays, and were I to demur against such, I should very soon be informed that I must look out for a situation elsewhere.

I, for one, will gladly give my portion towards a fund for the open exposure, by advertisement, of the keepers of these vile dens, although, I am sorry to say, there are many photographers of high-standing who persist in keeping open on Sundays, as they say, to oblige parties who are closely engaged at work in the week-days.

Why then, ought not the photographer's operator enjoy the Sabbath as well as the mechanic or other tradesmen? Perhaps some of the vile Sunday-photographers will answer this question.

Not wishing to encroach upon the pages of the NEWS, I will conclude by subscribing myself, A SUNDAY OPERATOR.

TAXES FOR PHOTOGRAPHY.

SIR,—As a subscriber to the NEWS from the first day it appeared, allow me to ask, if you are aware of the injury you will probably do to photography by publishing such restrictive propositions as have appeared lately therein.

Photography is, and should always remain, as free as the light which is its life. No Royal Commissioners have injured it to the thousandth part of the extent that some of your correspondents would; and what can the Royal Commissioners think of a fine art which trembles before the success of the parties denounced? Sir Charles Eastlake might as justly attempt to stop the poor unfortunate ones who wander from town to town, silhouetting and painting extraordinary representations of the human figure; or Fenton, and Bedford, Silvey, and others of the same class, might with as much reason protest against any one photographing who was not as proficient as themselves.

Pray do not allow the patient to be poisoned, that you may show your skill is recovering him; and oblige every true lover of photography, as well as your correspondent, LUX.

Talk in the Studio.

THE PHOTOGRAPHIC EXCHANGE CLUB.—We have pleasure in informing our readers that a good number of names of gentlemen anxious to join the Photographic Exchange Club have already been forwarded to the secretary. As, however, several have not yet sent pictures, the distribution of Exchanges will not take place until early in December. It is desirable, that the prints for that exchange be forwarded to the secretary as early as possible.

PHOTOGRAPHS OF GHOSTS.—The *London Review*, in an article on the tendency in modern literature to the revival of ghost stories, suggests to the writers as a means of verification, that they obtain photographs of their spectral visitors. It says: "Now, if the spectre can ask the favour, let science do it a good turn Let optics and chemistry catch this modern ghost and photograph it! It can fix the tails of comets and the atmosphere of the sun; the other day a photographer at Berlin caught a stream of electric light flowing out of the bronze spear of Kiss's "Amazon." A ghost can hardly be less material, if it wear crinoline, is helped twice to beef, drinks claret, and wants a portrait taken. The photographer's plate is liable to no delusions, has no brains to be diseased, and is exact in its testimony. We will believe even in the modern ghost if it can be fixed on paper. And it can surely walk into Claudet's or Mayall's, if it can go to the theatre.

CHINESE PHOTOGRAPHS.—We understand that Signor Beati, so long engaged in China and the East in photographic operations, has just arrived in this country with a large stock of pictures, many of which, we understand, include scenes during the late war.

To Correspondents.

J. H. M. RITSON.—Prints may be kept a few days in a sensitive case, without much deterioration, but they will not tone so readily as if done at once after printing.

H. S. S.—The stains caused by iron developer may be removed by oxalic acid, or "salts of lemon." 2. We do not prefer the use of citric acid with an iron developer; but you may use 1 grain of citric acid in place of 15 minims of glacial acetic acid.

THOS. WARDELL.—The principle of the bath tester to which you refer—that of the hydrometer—is good. We cannot, of course, speak of the accuracy with which they are manufactured. 2. Oxide of silver for correcting the nitrate bath may be had of almost any chemist, or may be very easily prepared impromptu.

J. L.—Dallmeyer's No. 2 B lenses, to which you refer, are larger, and cover more than is necessary in stereoscopic pictures. If you require lenses to serve for stereoscopic and card pictures, the No. I B lenses of the same maker will answer your purpose.

G. DE SANQUI.—We are obliged by the extract, which shall appear.

B. Z., LONGTON.—We will take an early opportunity of trying the solution. Bichloride of mercury is the basis, we perceive, as in most of these preparations.

M. U. D.—In working the solar camera the paper is much more sensitive if used wet. Mr. Smith's address is, George Street, Euston Road.

DEVON.—The amount of washing you give your plates, both before and after the albumen, is insufficient; and when there is free silver present, any hesitation in the flowing of the subsequent preparations very easily causes marks. Wash more thoroughly, especially before applying the albumen solution. The gallic acid solution may be used in a dipping bath, and may be used so for a dozen plates without injury.

FREDERICK BARTON.—We are obliged by the specimens and interesting communications which arrived in due course, the acknowledgment simply stood over for lack of space. The prints are very fine as reproductions, and the printing excellent.

G. HILMAN.—Place the oxide of silver in a bottle with a little distilled water; shake up well, and add a few drops of the turbid solution to the old silver bath. Agitate well, and when it is quite neutral, or slightly alkaline, expose to light for some hours. Now filter the solution, and strengthen with a little fresh silver if it be weak. Try a picture, and if the shadows are not quite clean, add a trace of nitric acid.

N.—The prints 1 and 3 appear to prove your position as regards weak baths; but we should like to know more of the conditions. The stains appear to have been caused by contact of the finished print with some acid. Measles, or the defect to which that designation has been given, is a very definite thing, and when once seen does not admit of any mistake. It consists in a number of yellowish brown spots mottling the print all over. It always arises from imperfect fixation, the dark spots being caused by decomposed hyposulphite of silver. We have seen similar stains to those in your prints from contact before the print was perfectly washed from the hypo with citric acid, and other acids will produce a similar result. In order to judge correctly as to the qualities of the lens, it would be desirable to know its focal length.

THE SPOON PLATE HOLDER.—We have received from J. H. J. a letter complaining that having sent stamps to Mr. Rendle, of Ilfracombe, and receiving no acknowledgment for several weeks, and then only a letter say that the delay was caused by the difficulty of procuring, in a country place, the india-rubber required. We have received a letter also from M. A., giving a similar explanation of the delay, and initmating that the article would probably be undertaken by some London manufacturer, of which due notice will be given.

M. A.—We received your former letter. The answer was delayed, partly by pressure upon our space, and partly from a wish to know more of the plate-holder before answering. We have seen the one sent up to London. So far as we can judge, the cost of making them, so as to be convenient and efficient, would be much more than 1s. 2.—There is no infallible sign to guide the inexperienced eye as to when a print is properly fixed. It sometimes happens that when a print is partially fixed, opaque spots are seen on holding up the picture to the light, which indicates that the silver is not entirely removed from those parts. It is the safest plan for those whose experience is not a safe guide, always to use a fresh 20-per cent. solution of hypo. If the paper be thin *Saxe*, 10 minutes will be sufficient time for fixing; if thick *Saxe* or thin *Rive*, 15 minutes will be sufficient; if thick Rive, 20 minutes may be required. Where that length of immersion renders the prints too light, they have not been printed sufficiently deeply to begin with. Where the delicate clouds of which you speak are present in the negative, but disappear in fixing, the print must be either printed deeper altogether, or the sky alone may be printed deeper. In the print you sent, the whole picture would have borne deeper printing. 3.—We shall be glad to receive a description of your print washing apparatus. There is no test sufficiently certain and delicate to decide when a print is freed from all traces of hypo. A solution of nitrate of silver is discoloured at once by any sensible quantity of hypo. A solution of protonitrate of mercury is still more sensitive to its presence. But neither of these are considered quite certain tests as to the perfect washing of prints. Any deviation from the prescribed plan of long washing and repeated changes of water, requires careful experiment, guided by an experienced judgment.

A STEREO AMATEUR.—The lenses used by Mr. Fry, for his instantaneous views, are Dallmeyer's rapid stereo lenses. The No. 1 B of the same maker would be slightly more rapid still, and would undoubtedly, with good light and chemicals, in proper condition, give instantaneous results for stereoscopic pictures.

J. B. B.—*Rive* paper will give you the most delicate detail and the greatest brilliancy.

J. C. H.—We are glad to learn that the lens we recommended proves so satisfactory Dextrine may be used for mounting prints. 2. A new solution of hypo, 20 per cent., that is 4 ounces in a pint of water, is strong enough for fixing prints; if it fail to do so it must arise from having been used for too many prints, so as to become exhausted.

J. P. E.—We are obliged by your communication.

A PHOTOGRAPHER.—The only practicable mode of taking photographs by night, that we know of, is by the *photogen*. Gas light would not be sufficiently actinic. 2. The preparation of the "liquid chromatones" is known, we presume, only to the manufacturers. We think their use is a mistake. The difference in tones in paper prints is due partly to the quality of the paper, partly to the kind of toning solution, and partly to the length of time the print is kept in the solution. The darker tones are obtained by a long immersion.

C. K.—Your toning solution has probably been acid, and the traces left in the prints have decomposed the hyposulphite. Possibly you have not washed the prints thoroughly before toning. The chloride of gold should be neutral, and the proportion of acetate of soda is 30 grains to 1 of gold.

H. C. H., N. X., A SEARCHER, C. U., W. C., HENRY ROSE, C. DE LANGUE, AN ARTIST, . C. V., D. H. F., and several others in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 166.—November 8, 1861.

PHOTOGRAPHY AND THE EXHIBITION.

Those of our readers who remember how large a share of the attention of the last meeting of the Photographic Society was engrossed by the prospective position of photography in the forthcoming International Exhibition, and how important are the issues which have arisen since, will naturally expect to find, in our report of the first meeting of the winter session, some allusion to the matter: possibly they will look for some expression of regret for past miscarriages, probably for some intimation that the hope held out in the last number of the Society's *Journal*, of renewed effort on the part of the Council had ripened into action.

Singular as the fact may be, however, not a word of any kind was uttered on the subject, either by officer or member. Notwithstanding that the topic has occupied a large share of the Society's *Journal* for months past, in the meeting it was entirely tabooed. The Chief Baron has made it a custom for some years, in opening the winter session, to pass in brief review the events of interest to the Society which have transpired since it had last met. On this occasion we naturally looked for some allusion, characterised by the good sense which usually distinguishes the worthy president's remarks, to a subject of such vital interest. For the first time, however, if we are not mistaken, on such an occasion, no introductory remarks were delivered from the chair. No question on the subject was asked by any member: the Exhibition was entirely ignored. So far, therefore, as there is any official intimation, the Society does not appear to have taken any further action, but may be regarded as having practically ceased to interest itself in the matter.

If the Society be considered as representing photographers at large, Her Majesty's Commissioners must be struck with their extraordinary supineness in the matter. Whilst other branches of art and industry are represented by the various trade committees, and local committees, photography alone is unrepresented. True, as we announced in our last, a committee will be appointed, and we trust an efficient one; but we should have been better pleased, if it had been the result of more consentaneous or representative action amongst the photographic community at large.

We are glad, however, to believe that so far as the question of contribution is concerned, the best of our photographers will not be inactive. We are glad that the recommendation, to abstain from contributing unless the demands of the Society were complied with, which at one time formed part of the Society's plan of protest, was quietly allowed to drop, and that whatever might have been the views of the Council in their corporate capacity, those of them whose contributions will add grace and importance to the Exhibition, have duly applied for space in the proper department.

We are especially glad that the idea which at one time seemed to find a few supporters, of getting up a "little go" in opposition, seems to be entirely abandoned, and that photography is spared the stigma of the pitiful failure which must have resulted. And we congratulate the South London Society, for having at least contributed its share towards assuring Her Majesty's Commissioners that photographers are not entirely indifferent to the representation of their art in the grand gathering of the world's art and industry. How far their memorial influenced Her Majesty's Commissioners we have no means of knowing; but we may set down the two facts in juxtaposition, that they memorialized the Commissioners, and that within a week or two afterwards we were authorized to announce that a committee would be appointed.

Apropos of this subject we may notice that a contemporary commenting on this act of the South London Society, and rating it in "good set terms" for its presumption, seems to have some queer misapprehension of the law or facts of the case. "It was altogether an irregular, not to say an illegal, proceeding," on the part of the Society to adopt such a memorial without previous notice, it is stated; and it is added that the memorial could not be the document of the Society, because each member did not give his individual assent to it. We are almost tempted to believe that our good friend, the editor of the *British Journal*, is indulging in a little badinage at the expense of this "small (not to say very small) suburban society." The notion is really as new to us as we apprehend it is to all our readers, that a motion may not be put and adopted by a meeting without previous notice; and that a resolution passed *nem. con.* by a meeting of a society, regularly convened, and fairly attended, is not the document of that society. We have been in the habit of attending many meetings of all kinds for the last score of years, and until now we never heard such an idea mooted; but we have, on the contrary, frequently known most important motions, absolutely have their origin in meetings, growing out of the immediate proceedings, and without any premeditation whatever, passed by small majorities, without anybody dreaming of disputing their legality. True, all motions having for their object the alteration of the rules, or the modification of the constitution of a society, require that previous notice be given, and that simply because such notions involve not merely doing some new thing, but also setting aside something formerly agreed to. We can assure our contemporary that it *is* customary to pass motions without previous notice, and that societies *are* in the habit of adopting, as their collective act, resolutions agreed to even by a majority, not to say unanimously. Nay, more, that the answers returned a few months ago to the appeal of the parent society were chiefly the results of motions put without notice, and adopted as the acts of the several societies, without any attempt to consult them individually. In fact, we believe no rule is more universal, or better understood, than that the decision of a majority in any meeting properly convened, is the recognised act of that meeting, provided it does not contravene any rule or decision already in existence, in which case, as we have said, notice should be given. Any dissentient individual may record his protest, for self-protection, but so far as the legality and representative character of such decisions are concerned, is not matter for doubt.

We incline to the opinion, however, that our contemporary was what is vulgarly termed "chaffing" the South London Society. We cannot believe that a serious taunt, as to its "smallness" would be levelled against a society of three or four score gentlemen for doing promptly what they conceived necessary to be done. Any notion of an actual sneer would be too suggestive of some feeling in connection with the recent severance of representative and journalistic ties, a feeling of which we would not willingly believe our contemporary to be capable.

ON THE NATURE OF THE PHOTOGRAPHIC IMAGE FORMED IN PRINTING AND TONING.

BY T. A. MALONE.*

After an apology for the extemporaneous character of his remarks, and some observations on the interest and im-

* An extemporaneous address, delivered at the meeting of the Photographic Society, on the evening of Tuesday, November 5th, 1861.

portance, as well as the difficulty, of the subject, Mr. Malone proceeded to ask :

What was the photographic image, in what manner did it act, and in what manner was it acted upon by the various agents employed in its production and toning ?

As was well known, considerable difference of opinion prevailed on this subject: some held that organic matter, the paper, served merely as a vehicle to support the chloride of silver, on which the image was formed; others held that it served as an adjunct in producing the image. There was no doubt, however, about chloride of silver being the basis, and the question then presented itself: How does light act on the chloride of silver? The question had been answered in various ways. Quite recently, the eminent Dutch chemist, Mulder, had given considerable attention to the subject, having thought it desirable to conduct some assays by the wet method, precipitating the silver as a chloride. Finding, of course, that chloride of silver was liable to be darkened by light, he wished to know accurately what was the action of light upon it. Fresenius, the celebrated analyst said that chloride of silver exposed to light, lost weight. This loss of weight was due to the liberation of chlorine. Light acting upon chloride of silver did liberate chlorine; that was ascertained: there was no question on that subject. Now came the difficulty, however, and the question was: Did the light reduce the whole of the silver, and liberate the whole of the chlorine? Some held that it did; that was, as far as the light could go. Others held that it only liberated a portion, and formed a subchloride of silver. This statement of the case, at first sight so simple and easy, became very difficult of proof, because of the nature of the process. In carrying out the process, the whole of the chloride of silver was never exposed to light, and it would be evident at once how a difficulty thus arose. They knew light darkened this substance (placed in water in a bottle), but it darkened it on the surface; and that darkened surface at once acted as a screen to all the rest. Now, what was true of a bottlefull, some said, was true of each molecule; the surface of each particle was acted on and blackened by light, but the interior was shielded by the darkened surface, and so the action was not complete. If this darkened substance were treated with fixing agents, such as hyposulphite of soda, &c., they found it was separated into a solution containing chloride of silver and spangles, resembling metallic silver. This was the whole account of the transaction, said some. But these spangles bore no resemblance to the dark substance, and the proportion was so small, that it did not appear credible they could possess so much colouring power. This view involved that metallic silver had not that colouring power. He was, however, prepared to show that it was quite possible that it was metallic silver entirely, and not a subchloride, an oxychloride, &c. &c., as had been supposed.

In order to arrive at these conclusions he proposed to abandon analysis, which had presented so many difficulties, entirely, and proceed to the enquiry purely by synthesis. That was, he would produce by chemical means a similar substance, and show that it was metallic silver. This being done, he thought they would be in a fair way to clear up the difficulty; and analysis having failed through their not being able satisfactorily to isolate the substance, he thought it would be admitted that the synthetical method was quite a legitimate resource. He had been led to this method of examining the matter, by Professor Faraday's paper On Ruby Gold, in the transactions of the Royal Society, the perusal of which, led him to think that analysis having failed, synthesis might solve the problem. The method Mr. Faraday had adopted in regard to ruby gold, he proposed to follow with regard to reduced silver. Mr. Faraday had simply shown that there was good reason why the ruby tint, produced under some circumstances by gold, and which by some was believed to be the result of some chemical combination, was simply metallic gold, in a very fine state of sub-division. Chemistry would of course demand more than this, it would require the atomic constitution and weight. A certain bulk of this ruby gold must be taken and weighed, produce it as yellow gold, and then weigh again, and show that it has not lost one particle of weight. This, Faraday thought he had done; but not with all the precision analytical chemistry demanded. Well then he, Mr. Malone, thought they might also have ruby silver. Of gold there were various tints produced, they had ruby gold and blue gold, and he believed the same colours might be had in silver. And if this were the case, and they had thus the two opposite ends of the spectrum, and—he might add he believed yellow—why not all other variations or combinations of colour? If he could show to them this characteristic of gold, and show the analogy in this respect between silver and gold—and, he might perhaps add, platinum also—he thought they could come to no other conclusion, than the experiments of Faraday tended very materially to explain the nature and formation of the photographic image. This was not a new statement: as many present were aware, he had already expressed his conviction that there was no reason whatever why the photographic image might not consist entirely of metallic silver entangled with organic matter. He would now proceed to illustrate his position.

Gold, as every one knew, was soluble in nitro-muriatic acid. For the purpose of this experiment he had dissolved some pure gold in aqua-regia, and evaporated to dryness, which he now produced. They would notice that the red colour showed that all the acid was expelled. This chloride of gold he now dissolved in water. It might be reduced in a variety of ways: oxalic acid with the aid of heat would reduce it; it would fall in thin flakes of pure gold. Protosulphate of iron would reduce it, not in a ruby condition, but in a brownish or purple powder. Chloride of tin would reduce it in a rich purple powder, known as the purple of Cassius. It was long thought that this consisted of a compound of gold and tin, but it has since been shown that it consisted of pure gold in a fine state of subdivision. It would seem, then, that the colour of a reduced metal was largely governed by the agent employed in the reduction. The agent photographers had to deal with was light.

For the purpose of his experiments in obtaining the ruby gold, he might reduce it either by means of phosphorus, dissolved in bisulphide of carbon, or in ether. Those present interested in the electrotype process might remember the elegant method of reducing silver by means of phosphorus. When it was desired to electroplate a plant it was dipped into a solution of phosphorus in ether, and then into a solution of nitrate of silver, the phosphorus reducing the silver and giving the plant a metallic coating which served as a conductor in electrotyping. As phosphorus in ether would be less offensive in smell than bisulphide of carbon, he would use it for his experiment, but he had both present.

Mr. Malone now dissolved a piece of phosphorus in a little ether, remarking that it would be seen that there was no metallic base present, and no organic matter such as might effect the question, simply phosphorus, carbon, hydrogen, and oxygen. He would now add this to the solution of chloride of gold. This was done, and immediately a stratum of dark ruby colour was seen at the point of contact, which gradually increased until the whole became of the same dark tint. This was diluted with a large bulk of water without in any material degree attenuating the colour.

This colour, he remarked, was simply due to particles of gold in a very fine state of division, and although gold was the heaviest of metals, it would remain thus for years without settling. He called attention to the very great colouring power it possessed, notwithstanding the amount of dilution. The particles were so fine that they could not be all filtered out, but much passed through the finest filter, and this fact gave rise to the notion, in the first instance, that it must be in solution, not merely in suspension.

It did, however, eventually precipitate, and, by agitation in narrow tubes, it was found to settle, and could be collected as a deposit; and he (Mr. Malone) hoped shortly to be able to settle its atomic constitution. Having done that for gold, he hoped to do it for variously coloured silver, and that would not leave a shadow of doubt on the subject.

He would now perform a similar experiment with silver.

He would take a solution of the nitrate, because, as they were aware, the chloride was not soluble. [The lecturer then added a portion of the solution of phosphorus in ether to a solution of nitrate of silver, which immediately darkened in the same manner as the gold had done, and when considerably diluted with water, showed similar high colouring power.]

This high colouring power, he remarked, was, as in the case of the gold, solely due to the minute division of the metallic silver, as there could not be a doubt of the absence of organic matter, as usually understood. He was aware that Mr. Hardwich held that organic matter was necessary to the production of the red tint in silver, and that he stated that gelatine, saturated with nitrate of silver, exposed, and dissolved by the aid of potash, presented a blood-red colour. He believed this colour was simply due to the state of division in the metallic particles, and he conceived that he had a perfect right to assert that it was simply ruby silver—finely divided silver. It was pure assumption to say that it was the result of any combination with the gelatine. Other organic substances might aid in producing this fine division of particles; but he believed the colour was in all cases due to such division.

At this stage of the experiments, Mr. Malone filled a bottle with oxygen, and then placing in it a piece of phosphorus, which he ignited, procuring an exceedingly brilliant white light, for the purpose of better showing the ruby colour of the solutions.

He now referred to the question of toning. On adding to a solution of ruby gold, or ruby silver, a little hyposulphite of soda, it became purple. It was generally supposed that this was due to the action of sulphur. He thought that there was room to doubt this. Chloride of sodium, common salt, would produce just a similar effect. This showed that sulphur was not necessary to the production of the result. Chlorine alone would do it. Mr. Hardwich was aware of this, and attributed it to the formation of a sub-chloride of silver. This could not be true, however, of gold, as the yellow colour would detect it. As regarded the rationale of the matter, they all knew that different degrees of subdivision of bodies gave different colours; the point was to find the process. In regard to gold and silver, he thought he had found it. Gold leaf when beaten very thin, became green; and the same leaf might be in part ruby by transmitted light. Other tints might also be produced.

The lecturer now added a little of a solution of hyposulphite of soda, to the solution of ruby gold, which assumed first a purple tint, and then a decided inky hue.

A little of the ruby gold solution spilled on paper, he observed, became of a purple tint, probably from some chloride in the paper, or possibly the alum might cause it. The principle here involved, he believed, was that on which toning was effected, and it was probable that the varieties of toning were due to one simple difference, the acceleration or retarding of this deposit. Photographers were aware under some circumstances the prints which had appeared sufficiently toned, lost their colour again in the hyposulphite of soda. He thought it very probable that this circumstance would be easily explained on the principle to which he was referring.

The same principle which applied to gold would apply to silver. And if they could get the colours he had named, they could, by mixture, obtain any tint. These finely divided metallic particles would in fact constitute pigments. The speaker then referred to the experiments of Becquerel in securing the various colours of the spectrum on chloride of silver, each ray giving its own colour, whilst white light produced white, and stated that he had recently been making some experiments in the same direction. He had obtained copies of some roughly coloured French pictures, as also had M. Niepce de St. Victor, in which there was a decided approximation to the colours of the originals, the whites were represented by white, and the blacks by a dark colour. If the various colours of the spectrum could be produced by the action of light on chloride of silver, he thought there was a striking analogy between the experiments of M. Becquerel and those he was now pursuing. He thought he had proved that a very minute portion of metal indeed was sufficient to produce very intense colouring powers. He had before demonstrated that the eight-thousandth part of a grain of iodine was sufficient to give the colour to a silver plate, necessary for producing the Daguerreotype. They all knew that silver in some forms was black: sugar of milk, ammonia, caustic potash, and some other substances would throw it down from the nitrate on to glass, and when so thrown down, it was purple by transmitted light, as Liebig and Stas had demonstrated, and as was evident in the specimen before them. He thought then that the experiments he had brought before the meeting, and the facts he had stated, were calculated to throw considerable light on the subject of the formation and toning of the photographic image, and tended to show that finely divided metallic particles were quite sufficient to give the depth of colour without the aid of organic matter.

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Phosphorus *and its compounds.*—The compounds of this element have not hitherto been used to any great extent in photography, although from the little that is known of their value in the art, there is no doubt that these bodies would well repay attention. Amongst them we find very powerful reducing agents, and the silver compound of one of the phosphorus acids possesses very valuable properties which have been utilized successfully by Mr. Maxwell Lyte. The element itself appears to possess a certain degree of photographic sensitiveness, inasmuch, as one, if not more, of its allotropic modifications is produced by the action of light upon the ordinary variety of phosphorus.

The element phosphorus is prepared by a somewhat difficult process: by the action of carbon upon phosphoric acid at a white heat the oxygen of the acid unites with the carbon, and sets the phosphorus free. As usually met with in commerce this element is a colourless, or faintly yellow, waxy-looking body, brittle in the cold, but of the consistency of wax at the ordinary temperature. It melts at a slight elevation of temperature (108° Fah.) and volatilizes readily at high, and in small quantities even at ordinary temperatures. The most characteristic property of phosphorus is its extraordinary inflammability, which is made use of to an enormous extent in the manufacture of lucifer matches. The statistics of this branch of manufacture are such as to appear fabulous. In England, where the manufacture is comparatively small, upwards of 6 tons of phophorus are used yearly, producing upwards of 50 millions per day. One manufacturing firm, Messrs. Dixon, turn out every year 2,160,000,000 matches, or more than sufficient to go round the earth if laid end to end. In Austria, the greatest seat of match making, two firms, those of M. Pollak, and M. Fürth, consume about 20 tons of phosphorus yearly, and as one ton is sufficient to tip upwards of 1,000,000 of their matches, these two makers alone produce the amazing number of 44,800,000,000 matches yearly. The total produce in Austria is estimated at 2,500 tons.

Mention has been made above of an *allotropic* modification of phosphorus: this term is used to express a condition which an element sometimes assumes in which it has different properties physically (and sometimes even chemically), from the same body in its ordinary state. Thus, the diamond is said to be an allotropic modification of carbon. In like manner, phosphorus exists in more than one allotropic state. The most important of these is the one which it assumes when the ordinary variety is kept heated in a close vessel under pressure, at a temperature of 450° Fah. After about three or four weeks, a quantity of about 2 cwt. may be completely converted into a hard brick-red substance, which, when properly purified, is known as Schrötter's Red Phosphorus. There is quite as much difference between the white and the red phosphorus as there is between two distinct elements, silver and copper for instance; and were it not that we can artificially convert one variety into another, they would be looked upon as separate elements. Their difference is strikingly shown by a comparison of their properties. The ordinary white variety of phosphorus is poisonous; evolves a strong odour; is phosphorescent; luminous in the dark; melts at 108° Fah.; is very transparent; almost colourless; freely soluble in various liquids; distinctly crystalline; so soft as to be easily indented by the nail; and at the ordinary temperature is as flexible as copper or lead. The red phosphorus, on the other hand, is innocuous when taken internally; nearly odourless; not phosphorescent; perfectly non-luminous; melts at above 500° Fah.; is opaque; varies in colour from nearly black with metallic lustre, to iron-grey, brick-red, crimson, and scarlet; is nearly insoluble in all liquids; is destitute of all crystalline structure, (amorphous;) is as hard as a common red brick, and as brittle as glass. The most important and conspicuous fact connected with the red phosphorus is, that it may be exposed to the air in the dry state, and freely handled with no fear of its inflaming; whilst the white variety is rapidly ignited in contact with atmospheric oxygen. This red variety is now much used in the manufacture of safety matches.

The most important compounds of phosphorus with which the photographer is likely to come in contact, are its oxides: owing to the powerful reducing nature of the lower oxides, it is not unlikely that they may be eventually used in photography. We shall, therefore, briefly describe them, as well as the principal oxide—phosphoric acid, which is already somewhat employed.

Hypophosphorous acid, a combination of equal equivalents of phosphorus and oxygen is now prepared in some quantities in combination with iron and other metals for medicinal purposes. It is made by boiling phosphorus and baryta water together till the vapour no longer has a garlic odour; the baryta is then to be exactly precipitated from the filtrate by cautious addition of sulphuric acid; the liquid, again filtered, may be concentrated by evaporation. Hypophosphorous acid forms a colourless, uncrystallizable, very acid solution, which has remarkable reducing properties upon silver and gold salts. From nitrate of silver the acid or any of its soluble salts throw down a white precipitate which soon turns brown, and is converted into metallic silver, the change being further accelerated by the action of heat or light. It is probable that a solution of hypophosphite of soda would prove a good developing agent for collodion plates, especially if there were no excess of free nitrate of silver present. The great aim of photographers at present should be to discover some more powerful developing agent, whereby the latent image—which by many high authorities is supposed to be impressed on the sensitive surface the moment light falls upon it—may be brought out. Certainly, to have a really instantaneous process a very sensitive and impressionable film must be used; but it is no less necessary to employ a powerful reducing agent. More, indeed, now depends upon the latter than upon the former, and we think from experiments tried in our laboratory that these lower acids of phosphorus will prove valuable adjuncts to the hitherto employed developing agents. They are not now suggested for the first time, but we do not think they have ever been used in practice beyond an experimental trial or two.

Phosphorous Acid.—Another reducing agent of this class, and one which is somewhat more manageable than the one first mentioned is phosphorous acid. A very good way of preparing it on the large scale is to pass chlorine through water on to some phosphorus at the bottom. The chlorine and phosphorus unite, forming terchloride of phosphorus, and this is immediately decomposed by the water with formation of hydrochloric acid and phosphorous acid. Care must be taken to keep the phosphorus in considerable excess, otherwise pentachloride is formed, which decomposes into the pentoxide, phosphoric acid.

The solution which contains, along with the phosphorus, hydrochloric acid, is to be concentrated in a retort, when the latter acid goes off and leaves the former in pure aqueous solution. Thus formed, phosphorous acid is a colourless, very acid liquid which must be preserved in close vessels, otherwise it has a tendency to oxidize and form phosphoric acid. It unites with bases, and forms phosphites. When a soluble phosphite, or the free acid is added to a solution of nitrate of silver or chloride of gold, metallic silver or gold is thrown down, the former being brown-black when precipitated from a cold solution, and black when precipitated at a boiling temperature. When the acid is concentrated at a gentle heat to a thin syrup it forms crystals; but when concentrated to a greater extent, like the hypophosphorous acid last mentioned, it decomposes water, evolving phosphuretted hydrogen, and becoming oxidized to phosphoric acid, the highest oxide which phosphorus forms, and by far the most important of its compounds.

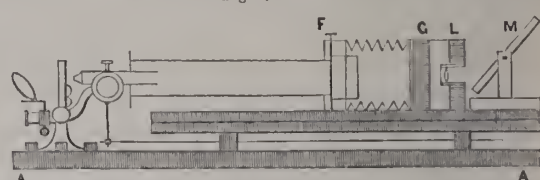
ON THE PRACTICAL APPLICATION OF PHOTOGRAPHY TO THE MICROSCOPE.

BY PROFESSOR O. N. ROOD.*

While the value of the photographic delineation of microscopic objects, as a means of accurately recording observations, seems to be generally acknowledged, yet, owing to the real or imaginary difficulties with which the process is beset, but very few working microscopists have adopted it. After eight months of steady experimental work on the subject, this fact appears to me a matter of astonishment, for the difficulties which are not inherent mostly disappear when proper precautions are taken. I propose to mention briefly certain points in my experience, and to indicate the methods pursued.

Arrangement of the Apparatus.—The microscope is brought into a horizontal position, and connected with a camera box, by a blackened pasteboard tube: much vexation will be avoided by constructing at the outset the arrange-

Fig. 1.



ment seen in the woodcut. *Fig.* 1. Blocks are fitted around the foot of the microscopic that it may be held firmly in position, and the camera box slides between parallel strips of board, so that its distance from the microscope can be varied. The length of A A is seven feet. The frame holding the ground-glass slides is at G; behind it, at L, is a door on hinges, carrying an achromatic lens of two inches focal length, for the purpose of magnifying the image on the ground-glass while focussing: the glass plate should be finely ground. A tube lined with black velvet is to be inserted in the compound body, as recommended by Shadbolt, if the eye-piece is not employed. Precautions must of course be taken that light does not enter at unguarded points. At F is a rod connected with a flap of blackened sheet brass in the interior of the box, with which the exposure of the sensitive plate is very conveniently effected. It is obvious that while the operator is manipulating the mirror, or using the stage-movements, on account of the length of the apparatus, it is impossible for him to see the ground-glass, or even to know when light has been thrown on it, a plane mirror, mounted as seen at M, reflects the image of the ground-glass, enabling him not only to arrange the illumination with nicety, but to select the microscopic object, and to focus on it approximately. While the mirror is in use, the door carrying the achromatic lens stands open; the mirror is

* From *Silliman's Journal*.

afterwards removed, and the focal adjustment completed with the help of the lens, by the rod and lever attached to the rack-work of the microscope. If the rack-work is moderately good, this arrangement is very delicate. When a high magnifying power is employed, it is essential that the microscope be provided with stage-movements to bring the object into its proper position. The lever stage is not to be recommended for this purpose.

Illumination of the Object.—That direct sunlight is greatly to be preferred is admitted by those who have experimented on this point. With light from a white cloud I have obtained negatives, in from one to three minutes, with 1 inch and ½ inch objectives: though not highly magnified, they were inferior to those taken with sunlight. Shadbolt obtained negatives by concentrating the light of a small camphine lamp on the object with two lenses. Wenham in repeating this experiment, met with no success. I concentrated the light of two flames of "burning fluid"* lamp with a bull's-eye condenser on the object, employing the 1 inch objective without an eye-piece, and obtained, with several samples of collodion from the different manufacturers, absolutely no image at all, after an exposure of five minutes. With samples prepared by myself, tolerably intense negatives were obtained in four minutes. With the ½ inch objective a faint image was obtained in the same time. For my own work direct sunlight is always employed.

It is well known that the proper display of microscopic objects requires that great attention should be given to their illumination, not only in degree, but in kind: much has been written on this subject, and an astonishing amount of labour bestowed on it. All this applies with double force to the illumination preparatory to the introduction of the sensitive plate: refined methods here find a most useful application. If the power employed be under 100 diameters, the plane or concave mirror will answer, if the stage be provided with a diaphragm-plate having apertures of different size. The mirror should be most carefully adjusted, so that the maximum of distinctness in the image on the ground-glass is obtained. I was kindly furnished by Prof. Chas. A. Joy with a *silvered* mirror which Liebig presented to him some months ago, while on a visit in Europe. It furnished brighter light than the ordinary amalgam mirror: the use of Liebig's mirror for this purpose, as well as for ordinary microscopic work, is to be recommended. With powers from 100 to 2,000 diameters, a condenser of some form is needed. For powers from 100 to 400 diameters, an achromatic condenser, adjustable by rack-work, was used. Such a condenser must be provided with a series of diaphragms, having circular apertures differing in size, also with a set of central stops for annular oblique illumination.

Trial alone will settle which aperture gives the clearest image in any particular case. As the lenses of this condenser were not large, I constructed for powers of from 400 to 2,000 diameters a Wollaston doublet, with an angular aperture of 40°, the lenses being ·5 and ·6 of an inch in diameter. This condenser, when provided with a similar set of diaphragms, was found to answer very well, both as to the degree and quality of the light, negatives being obtained in 15 seconds enlarged 1,500 diameters. As the chromatic aberration was not corrected, it was found easy to illuminate the object either with white or bluish-white light, use of the red or yellow rays being of course carefully avoided.

The proper distance of the condenser from the object is a point of much importance, and is best ascertained by carefully repeated trials. To obtain really good results much nicety in arranging the illumination is required: this is a matter in which microscopists are well practised; but, to secure the best results possible *under the circumstances*, as in photographing test objects, the art and patience of the operator is taxed to the utmost, and several days are often consumed before a really satisfactory result is attained, even in the case of a single object.

Focal Adjustment, &c.—Trouble will be saved by selecting the exact object which is to be photographed by the microscope in an upright position; the instrument is then inclined and connected with the camera. After the compound body is thus placed, if the objective is provided with a "screw collar" for correction, this adjustment must be *carefully made.* Even when this point has received attention, it by no means follows that the chemical focus coincides with the visual, and the exact correction necessitated by this difference must be ascertained by trial. This can be effected by the use of the fine adjustment (see Shadbolt's paper). Contrary to some observers I have found it necessary, when using sunlight, with both high and low powers, with and without eye-pieces, to make this correction carefully. The use of the rod and the lever and achromatic lens has already been mentioned. After the corrected image has been thrown on the ground-glass it will remain nearly unaltered from thirty seconds to ten minutes, according to the power and mode of illumination employed.

(*To be continued.*)

* "Burning Fluid" is a mixture of alcohol and camphine, commonly used in lamps in the United States.—Ed.

A FEW WORDS ABOUT GLASS POSITIVES,

WITH DEVELOPERS OF VARIOUS STRENGTHS, HOT DEVELOPERS, ETC., FOR WINTER PHOTOGRAPHY.

In a recent communication on negatives by positive process I promised at some future time a few remarks on the subjects given above. The season of the year is fast approaching in which I think it possible that the few hints that I may now offer will not be unacceptable to at least some of your readers. My last article was exclusively devoted to negatives; but as there are many photographers I know who confine their practice to glass positives, having a dread of negatives, and a fear lest their customers should not return for their prints. For such persons, principally, this article is now written; therefore I shall commence with the collodion and bath. My remarks, however, on that head will be simply a repetition of what was before published in my article on "Negatives by Positive Process," and I have, therefore, to ask the kind indulgence of those of my readers who have perused the article before alluded to, while this repetition is being made. The collodion I use is a good bromo-iodized one, which is free from crape-like lines, waves, and other irregularities, which gives a rich creamy and even film. The bath is composed of the purest recrystallized nitrate of silver, sold at 4s. 6d. oz., and not the ordinary crystallized at 4s., which, as far as my experience goes, is only suitable for printing, and which, if used in the bath, would be a never-ending source of fog and stains. My bath is composed as follows:—

Pure recrystallized nitrate of silver	40 grains
Distilled water	1 ounce.

In making an entirely new bath I generally dissolve 3 ounces of recrystallized silver in 33 ounces of distilled water. I then coat a large plate with collodion on both sides, and let it remain in the bath for a few hours, so as to saturate the solution with iodide of silver. At this season of the year a bath 45 grains of silver to the ounce of water would not be found any too strong. If everything is quite pure, a bath prepared as above will generally give very good results; but it sometimes happens that the bath may occasionally fog, to remedy which defect I keep in a separate bottle a dilute solution of nitric acid, as follows:—

Pure nitric acid	1 drop
Distilled water	1 ounce.

One drop of this dilute solution of nitric acid added to the bath will generally bring it into working order; but in no case do I add even this small portion of acid to the bath, if good results can be obtained without it; for it is a well admitted fact that if more acid is added to the nitrate bath than is absolutely necessary to the production of clean pictures, the sensitiveness of the film is considerably diminished.

The proportions of nitric and glacial acetic acid given in the formulas for developers, which are now about to be given, are so nicely balanced, that if more or less of either were used in proportion to the iron, it would be found to be injurious. Thus, if *less acetic acid* than is given were used, and the same quantity of nitric fogging would be the result: or *if less acetic acid and more nitric* were used, pictures of an unpleasant metallic glare would be the result; again, if *more* acetic acid, and the same quantity of nitric or less were used, pictures having a thickish deposit of silver more suitable for negatives than for positives would be the result. The developer I use in summer, which I will call No. 1, is made as follows:—

Protosulphate of iron	3 drachms
Glacial acetic acid	3 ,,
Nitric acid	3 drops
Filtered rain-water	20 ounces.

But in the winter season I keep five other developers in my dark room, as well as No. 1, which I label thus—1, 2, 3, 4, 5, 6, prepared as follows:—

No. 2.—	Protosulphate of iron ...	75 grains
	Glacial acetic acid	$1\frac{1}{4}$ drachms
	Nitric acid	5 drops
	Water	5 ounces.
No. 3.—	Protosulphate of iron ...	100 grains
	Glacial acetic acid	$1\frac{1}{2}$ drachms
	Nitric acid	6 drops
	Water	5 ounces.
No. 4.—	Protosulphate of iron ...	150 grains
	Glacial acetic acid	$2\frac{1}{2}$ drachms
	Nitric acid	8 drops
	Water	5 ounces.
No. 5.—	Protosulphate of iron ...	200 grains
	Glacial acetic acid	3 drachms
	Nitric acid	10 drops
	Water	5 ounces.
No. 6.—	Protosulphate of iron ...	250 grains
	Glacial acetic acid	$3\frac{1}{2}$ drachms
	Nitric acid	10 drops
	Water	5 ounces,

So that if any difficulty is experienced in getting pictures with a few seconds exposure with No. 1, we try No. 2 or 3 with the same exposure, and sometimes No. 6, and get satisfactory pictures in a dull light, which with developer No. 1 or 2 would be an impossibility. Photographers would find it much to their advantage in the cold and frosty weather if they would keep their vessels containing their bath and developing solutions in hot water during working hours, so that their temperature may be kept up to not less than 60 degrees, or even more than that, the difference this would be found to make in the time of exposure required we have found to be very great, somewhere about half the usual time being sufficient. I should think hot baths and developers would be found serviceable to those who are working instantaneous photography. Fix with cyanide as usual, and when dry, varnish with amber varnish.

T. S. Swatridge.

Princes Street, Yeovil, October 21st, 1861.

ON POSITIVE PRINTING.

BY EDWIN MUSGRAVE.*

Although I do not recommend that amateurs, whose printing is on a comparatively small scale, should albumenize their own paper, as they are more likely to obtain a good result by purchasing it ready prepared from a dealer on whom they can rely, than by preparing it themselves, I give here a formula for those who prefer albumenizing the paper themselves.

The first thing is the selection of the paper. I prefer the *Papier Rive* and Hollingworth's thin paper, as giving the best results in my hands.

The formula for the albumenizing solution is as follows: —To each ounce of albumen add ten grains of chloride of ammonium or sodium, dissolved in a quarter of an ounce of water. (Chloride of barium also gives a very fine tone. Some may prefer it. In that case it is requisite to double the quantity of the salt, to produce the same vigour of print as the other chlorides give.) Beat the whole up to a perfect froth with a bundle of quills or a fork. As the froth forms it is to be skimmed off into a flat dish to subside. When the froth has partially subsided, pour it into a tall narrow jar, or a bottle with a wide mouth, and allow it to stand for several hours.

An ordinary photographic dish is filled with the prepared albumen, by pouring it gently from the bottle into a glass funnel having a piece of clean muslin disposed as a filter, the beak of the funnel resting on the bottom of the dish to avoid the formation of bubbles. Having ascertained the right side of the paper, take a sheet by the two corners, bend it into a curved form, convexity downwards, and lay it upon the albumen, the centre part first touching the liquid, and the corners being lowered gradually.

"When the paper can be removed from the surface of the albumen without violently curling up, it is to be lifted by one corner, and allowed to drip for a few minutes, steadying it in a vertical position by holding also the adjoining corner with the other hand. After dripping for about a minute from one corner, the hand that steadied the neighbouring angle to that by which the paper was suspended is to be gently raised, so as to become in its turn the suspended corner, which proceeding will cause the albumen to flow off from a different corner to that from whence it first dripped, the flow being now at right angles to its former direction, After a few seconds—say half a minute—bring the corner next in succession to the highest point, and finally the the fourth corner upwards, taking care that each one comes uppermost in *regular succession*, so that the drip has flowed from each of the four corners. If the operation above described has been correctly performed, the paper will now be coated on the surface with an even film of albumen, scarcely flowing at all. The great point to be aimed at is to *keep it* in the condition it now presents—that is, an even, brilliant film; and to this end rapidity in drying mainly conduces.

"By attaching two American clips to a sheet of the paper the whole can be suspended in a vertical position from a cord. The paper should be hung with the *plain side* towards the fire, and as close to it as possible, so long as scorching is avoided. In about a couple of minutes the drying will be complete and the surface of the paper smooth and brilliant, provided that the manipulations have been correctly performed."*

The next operation is to sensitize the paper:—

Nitrate of silver	80 grains
Distilled water	1 ounce.

Lay the sheet of paper upon the solution in the same manner as described for the albumen: three minutes contact will be sufficient.

For those who prefer plain paper, Mr. Hardwich's citrate of soda salting-bath will be found to give a very fine warm tone with the alkaline gold toning-bath.

The salting solution is prepared as follows:—

Chloride of ammonium	200 grains
Citrate of soda	200 ,,
Gelatine	20 ,,
Water	20 ounces.

* Condensed from a paper read at a Meeting of the Edinburgh Photographic Society, and reported in the organ of the Society.

* Mr. Musgrave acknowledged himself indebted to the directions of Mr. Shadbolt in the *Photographic Journal* for the manipulations in albumenizing.

To prepare the citrate of soda, dissolve 112 grains of citric acid in the 20 ounces of water, and add 133 grains of the dried bicarbonate or sequi-carbonate of soda then add the remaining constituents.

Use Hollingworth's paper with the above formula, each each sheet being floated for one minute and then suspended to dry. Render sensitive by floating for two or three minutes upon the solution of nitrate of silver used for the albumenized paper.

Printing from the Negative.

The best kind of printing-frames to use are those with springs in preference to screws, as the latter are very apt to break the negative or glass of the pressure-frame. I prefer velvet myself as a pad behind the paper, as the short pile of the velvet presses the paper evenly all over, and secures fine definition.

If the negative be weak, with little intensity, print it in a very feeble light, with a thick green glass over it, by which means the shadows will be printed deep enough to give good contrast before the high lights are penetrated. But if the negative is intense, put it out in strong sunlight, so that the detail in the denser part of the negative may be printed before the shadows become too deep. You will by this means be able to get clouds if they are in a negative, supposing it to be a landscape—that printed in a diffused light would give only a white paper sky.

Occasionally one may have a negative that has been cracked; and, if the picture be of value, a print may be got from it by placing a piece of ground-glass about two inches above the pressure-frame, when the light carefully excluded from getting in at the sides, and place it in the sunlight to print. The result will be that you get rid of the objectionable white line caused by the reflection of the light from one side of the crack, and the print, if properly managed, will show scarcely any mark at all.

In some negatives the sky may be defective: in that case it is better not to paint out the sky of the negative, as doing so would prove the total destruction of the atmospheric effect. The best plan is to cover the sky with cotton wool, following the outline of the picture; and then, when the printing of the picture is completed, cover the part printed, take a piece of card, and shade the sky to the required tint, lighter at the horizon, increasing a little in depth towards the top.

When the print is removed from the pressure-frame it is placed in water, and the water is changed four or five times at intervals, till it is no longer milky. The print is then placed in a solution of salt and water, about a salt-spoonful of salt to a pint of water. This is to obviate the necessity of over-printing very much, and to prevent the toning and fixing baths reducing the intensity of the print. Allow the picture to remain in the salt and water from five to ten minutes: this will give a reddish tint to the print.

The print is to be steeped in fresh water, and is then ready for the toning bath.

Toning.

The toning-bath is prepared as follows:—

Solution of chloride of gold	1 fluid drachm
Carbonate of soda ...	... 10 grains
Distilled water ...	... 6 to 8 ounces,

The gold is best kept in solution one grain to the drachm of water.

The prints are to be immersed in this solution—if large, singly; small ones may be laid side by side, as many as the dish will hold, face downwards, and another set may be placed on the top, face upwards. Take care that the faces of the prints do not touch each other, or red spots will be the result, from the non-action of the toning-bath on the parts in contact.

The print must be allowed to remain in the toning-bath till it has acquired a rich violet tint. If purple tones are desired, it must then be removed from the toning-bath and rinsed in water, and then placed in the fixing bath—one ounce of hyposulphite of soda to six ounces of water. It must be allowed to remain in this bath for about twenty minutes, if an albumenized paper: plain paper requires less—from ten to fifteen minutes, according as it is thick or thin. When fixed (which is ascertained by holding the paper up against the light and ascertaining the absence of spots of imperfect fixation), it is placed in a large flat dish, in a sink, with a good stream of water constantly running, for about four or five hours. It may be then be taken out and immersed in nearly boiling water, and then dried and mounted.

I will now describe some of the failures. The most common are the following:—

1st. The print marbled and spotty after toning.

Causes.—A. Badly albumenized paper. B. The print allowed to rise to the surface of the toning bath. C. One, two, or more prints adhering or touching each other so as to prevent the action of the toning bath.

2nd. The print has a cold and faded appearance when finished.

Causes.—A. The chloride of silver in the paper in excess with regard to the free nitrate of silver. B. From too weak a negative being used the light has not had time to cause a vigorous action on the paper. C. Over-action of the gold bath imparts a cold and grey tone to the picture.

3rd. Small specks and spots of various kinds. These, when not corresponding to similar marks in the negative, are usually due to metallic specks in the paper.

Remedy.—Try the effect of keeping the paper a month or two, that the metallic particles may have time to become oxidized.

4th. Marbled stains on the surface of the sensitized paper.

Remedy.—Draw a strip of blotting-paper gently over the surface of the nitrate-bath, and see that the sheet does not touch the bottom of the dish.

5th. Removal of the albumen from the paper during sensitizing, and white deposit in the silver-bath.

Causes.—The bath is probably alkaline, and contains too little silver: add more nitrate of silver, with a drop or two of nitric acid.

6th. The print refuses to tone.

Causes.—A. Long keeping of the proof after printing. B. Too much alkali in the toning-bath.

When the printing bath becomes discoloured by use, Mr. Tunney's method of decolourising it will be found the most certain. It is as follows:—Add one drop of saturated solution of citric acid to the bath, and shake it up. This, if the bath be alkaline, will cause a slight deposit of citrate of silver, and will immediately clear the bath. The solution may then be filtered. If no deposit take place on the addition of the citric acid, it shows that the bath is still acid. In that case, one drop of ammonia added to it will at once produce the desired effect.

THE IODIDES: THEIR CHEMISTRY APPLIED TO PHOTOGRAPHY.

BY PROF. F. A. BOSSARD.*

Some time since I read in a photographic journal the following sentence: "Intensity is not in any manner dependent upon the kind of iodizer used in collodion." Such passage gave cause to the selection of the above title for this article. Repeatedly I have been asked by photographers—"What iodide is best for negative collodion?" It is a question which is, indeed, very important, yet I have never seen it fairly discussed. I will therefore endeavour to answer it, and give my opinion upon the subject to your readers.

An iodide in chemistry is a binary compound, and therefore consisting of two elementary substances. Thus, if we take the iodide of potassium (KI), we find, by submitting it to the action of a powerful galvanic battery, two separate

* From *Humphrey's Journal.*

substances called elements, the base, K, (kalium or potassium), being an electro positive element, is found at the electro negative pole, and I (iodine), performing in this case the part of an electro negative element, is found at the electro-positive pole. The general rule is as follows:—as chlorine acts on a base or other element, so does iodine; and the reaction of the iodides with the metalloids is analogous to that of the chlorides; consequently the manufacture of the iodides is similar to that of the chlorides, with comparatively few exceptions; and the bromides, although analogous to the iodides, yet their manufacture in several cases is entirely different from that of the iodides; as, for instance, bromine combines directly with ammonia to form bromide of ammonium, whilst iodine does not. These electro-positives combine themselves with the electro-negatives according to certain proportions only, and the quantities with which they combine are called chemical affinity, which we divide into two classes—first into single proportions, and second into multiple proportions. To single proportions belong all those that combine equivalent by equivalent, and to multiple proportions those which combine one equivalent with two of the other element, or with 3, 5, or 7, or 2 with 5 or 7, etc. By adding KI to $AgONO_5$, dissolved in HO, we obtain $AgI+KONO_5$ (+HO) or $AgONO_5+KCl=AgCl+KONO_5$. By such a double decomposition we see that silver has a greater affinity for iodine or chlorine than it has for nitric acid. The equivalent of I is =126, and that of K=39; therefore 126 grains of pure iodine require precisely 39 grains of pure potassium in order to be converted into iodide of potassium, and consequently they would give us 126+39=165 grains of iodide of potassium, which amount would be the equivalent of KI. Now let us take the equivalent of KI=165 (say grains), and we dissolve it in some distilled water, and next we dissolve the equivalent of $AgONO_5$ (170 grains of nitrate of silver) in some distilled water; we now mix the two, and we have not iodide of silver alone, but also nitrate of potash; for, since Ag has a greater affinity for I, it combines therewith to form AgI; now, the O of the silver combines with the K to form KO, which the powerful NO_5, that had left the AgO, redissolves, thus forming $KONO_5+HO$. Should the NO_5, which is a powerful agent, not meet the KO to dissolve it, we should introduce into our bath, by every plate we dip, just as much NO_5 as we remove of Ag, or rather the corresponding equivalent weight of the Ag used.

Some operators might ask—"Why should the $KONO_5$ stay in the bath, and not upon the film? or why should the AgI not stay in the bath!" To such I would say, that a bath or silver solution being saturated with AgI renders, of course, the AgI upon the film insoluble, and, it being retained by force of the proxyline in a minute state of division, is rendered inseparable from that film. Should we add too much iodide to the collodion, the consequence would be, that so great a quantity of AgI would be formed as to render it impossible for the collodion to retain it upon its delicate film, and consequently it would, as nearly all operators are aware, burst in particles out of the film. But let us make a solution of 100 to 150 grains of nitrate of silver to the ounce of distilled water, adding nothing else to it whatever; then coat a plate with collodion, dip it into this solution, remove it in a few minutes, and we will find little transparent holes upon the film, which are, in consequence of the silver solution not being saturated with AgI, thus rendering the AgI of the plate soluble in the solution. Put the plate back again into the solution, and leave it there several hours, observing it from time to time, until finally you will find that the AgI has entirely disappeared, and consequently has been dissolved by the $AgONO_5$.

Now the $KONO_5$, being itself soluble in water only, is partially washed off the film by the water in the bath, and when taking up the plate we naturally draw up a little of the bath solution, and there being with it a little $KONO_5$, such action produces a whiter picture, or rather a whiter film. This accounts for the fact, that collodion excited with KI and KBr has more tendency to yield a whiter film than other kinds of collodion. Many operators add $KONO_5$ to their developer in order to obtain whiter films.

Just so it is with the iodide of iron; it yields a white film because it forms the protonitrate of iron, which is known to most operators as a developer which yields fine white films. We certainly must regret the speedy decomposition of the iodide of iron in collodion. I have, however, of late adopted a new plan of obtaining protonitrate of iron upon the film before it is exposed. If I were to dwell upon this important subject now, it would take up too much time. I intend, on a future occasion, to make my new method known.

(*To be continued.*)

Proceedings of Societies.

London Photographic Society.

The first monthly meeting after the summer recess was held in King's College on the evening of Tuesday, November 5th. The Chief Baron in the chair.

The minutes of the previous meeting having been read and confirmed.

The Secretary read a letter from Mr. T. Ross, accompanied by a series of pictures taken by Mr. Harral with one of the panoramic lenses. The pictures included an angle of 100° on the horizontal line; the curved glasses were made to include 110°, and by very clean manipulation a picture having 105° might be obtained perfectly defined.

A letter from Mr. Dallmeyer was read, accompanied by a series of landscape specimens, chiefly by Mr. Wilson, taken with the triple achromatic lens. Its copying powers were well known and recognized, and these were intended to illustrate its landscape capabilities. The pictures included a very wide angle perfectly defined, were entirely free from distortion, and, some of them being instantaneous, showed the rapidity of the lens. The Chief Baron called especial attention to the exquisite delicacy and detail which characterized the pictures by the triplet lens.

Mr. Baynham Jones sent a letter and some specimens taken with an ordinary landscape lens. The lens had the focus of five inches, and the pictures were six inches long, including an angle of upwards of 60°.

Mr. Gordon Thompson sent a letter calling attention to the contemplated exhibition at Bradford.

Mr. Vernon Heath exhibited a series of views in Perthshire, On the Thames, &c., of which we shall speak next week.

Mr. Dallmeyer exhibited an instantaneous shutter for his stereoscopic lenses, the chief distinction of which was, that instead of having, as was usual, two distinct motions, one up and one down, the uncovering and covering of the lens was effected by one continuous motion. It also had the advantage of giving the greatest exposure to the fore-ground by first uncovering the lower part of the lens. It had been tried, he observed, and found effective. We will describe it in detail next week.

Mr. Shadbolt said it was an error to state that the fore-ground would receive the most exposure. Uncovering one part of the lens before the remainder would only act like placing a stop before it; the whole of the picture being exposed through that part.

Mr. Dallmeyer said surely Mr. Shadbolt misconceived the question. If he observed the motion of the shutter he would surely perceive that the lower part by which the foreground was depicted was uncovered first.

Mr. Shadbolt reiterated that it only acted as a diaphragm, reducing the aperture, and therefore giving less light to all the parts of the image.

The Chairman remarked that half a lens would give the whole image.

Mr. Dallmeyer said this would be the case with a single lens, and in regard to central pencils, but not so with regard to ex-centrical pencils. This shutter was, however, designed for use with his combination lenses.

Mr. Shadbolt said that if used with a portrait lens, it would, as Mr. Dallmeyer stated, expose the foreground first.

The thanks of the meeting were given severall t o the gentlemen who had exhibited their specimens.

Mr. J. A. Malone then read a highly interesting paper on the constitution and toning of the photographic image, illustrated with experiments, tending to prove that the image in the print is simply reduced silver in a fine state of subdivision (see p. 527). The thanks of the meeting having been awarded by acclamation.

The CHAIRMAN expressed the great pleasure he had felt in listening to Mr. Malone, and hoped they would shortly hear the results of his further experiments. He had been struck whilst observing the beautiful experiment of such a heavy substance as gold, held in suspension by the minute division of its particles, by the thought that it threw some light on the principle upon which the clouds were suspended in the atmosphere.

Mr. MALONE thought there was no doubt the clouds were composed of particles of water in a minute state of subdivision; not even in small bladders as had been stated.

The CHAIRMAN said that notion was the most absurd conceivable, notwithstanding that one person had said he had seen them. The theory Mr. Malone had put forth was moreover beautifully analagous to many other cases in which the state of minute division of bodies influenced their colours. He had pleasure in announcing to the meeting that sometime during the session, Mr. Warren De la Rue would give them an account of his visit to Spain, to photograph the sun during its eclipse. He could not help here remarking that he had more than once expressed a hope and conviction that photography would be a valuable means of extending our knowledge of the properties of light, and of detecting facts in connection with the sun, which at present we did not suspect. Mr. De la Rue had already shown that when the human eye was blinded with excess of light, photography could seize and delineate what the human eye could not perceive, and thus aid us to knowledge of the natural history of the sun, unattainable by any other means.

The SECRETARY then read a lettter from Mr. Rouch, enclosing a contribution to the Archer Fund, from the Photographic Society of Victoria, amounting to £5.

After the usual votes of thanks the proceedings terminated.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 6th November, 1861.

THE protracted season of fine autumnal weather has had the effect of detaining photographers in the provinces beyond the period usually fixed for the resumption of their weekly *séances*. The first meeting of our photographic society after the summer vacation, was appointed to take place on the 18th of October, but the attendance was so small that it was deemed expedient to adjourn the sitting to the 8th instant.

Yesterday an exhibition was opened at the Society's rooms, Rue Drouet, of the prizes in the lottery, the proceeds of which are to be devoted to a fund for premiums and awards for the encouragement of the art of photography, and which will enable the Society to organise another exhibition.

The season for practical photography has at length drawn to a close, after as favourable a summer as operator could desire. The fruits you will doubtless see at next year's Great Exhibition. But if the opportunity for practical essays now fails us, we can profitably recur to the the theoretical, and furbish up our old formulæ, methods, and processes, and give them a new gloss. "There is nothing so new as that which is forgotten," and many an unfertilized hint may be picked up among the leaves of an obsolete essay or manual. There is a fever of fashion in photography, as in most other pursuits: one day albumen is in the ascendant, at another it is waxed paper, then a mixture of both. Collodion, however, has managed to over-ride all other media, and seems in no present danger of being superseded. Were it less capricious and more manageable, under certain conditions of difficulty, it would be unexceptionable as a medium, and it is to be hoped that there is something really tangible in M. Garneri's proposed "mineral collodion." Viewed theoretically, this new medium looks promising. Hydrated silica, in a nascent state, is a substance whose properties are only imperfectly known. There are, however, numerous examples of the exceedingly great hardness it gradually acquires in the course of time, surpassing in that respect even glass, and almost attaining that of precious stones; a power of resisting scratches with the nail is not beyond the limit of possibility.

At a high temperature, and consequently under a great pressure water appears to be a solvent of silica, and this is the principal cause of a great number of silicious formations in tertiary strata from which mineral waters flow. But this solvent power of water upon silica is not available for photographic purposes, inasmuch as it only takes place at high temperatures, and ceases upon cooling again; but there exists a substance which has quite a special affinity for silicum, the radicle of silica, and forms with it a volatile body, a real gas; this substance is fluorine, which is known only in its combination with hydrogen, as hydrofluoric acid. This acid, which is extremely caustic, attacks silica either alone, or combined with the alkalies and earths, which gives to it the singular property of corroding glass, and rendering its surface rough, or "ground." In this action fluoride of silicum is formed, which in a dry state retains its gaseous form, like hydrochloric gas, but in contact with water, the latter is decomposed, and gives rise to the formation of silica and hydiofluo-silicic acid, which remains dissolved, and forms a very stable body.

In his mineral collodion, M. Garneri has taken care to introduce hydrofluo-silicic acid, which combines with a portion of the alkali, and remains suspended in the liquid in the state of hydrofluo-silicate. This is removed by filtration, and the filtered portion only, composed mainly of dissolved hydrated silica, is reserved for use.

In all probability there remains with the silica a portion of the anterior compounds which hold it in solutions, and we must seek the means of rendering this state permanent, under the influence of time and atmospheric changes.

The alkaline hydrofluo-silicate remains upon the filter in a gelatinous form, exactly resembling collodion coagulated by matter; but contrary to the latter (which requires to be deprived of all its water to be dissolved anew in alcoholized ether), it is sufficient to add an active body to dissolve it afresh; since this new collodion has water for a base, and not alcohol and ether, like ordinary collodion.

Like the collodion at present in vogue, this new collodion must be iodized. It is not a matter of indifference what iodide is introduced, as its solution is effected by the collodion alone, and gives the stability desired. The solvent must belong to the neutral class of bodies, and acid rather than alkaline to act with the silver bath. The alkaline fluorides present the greatest chance of success.

This mineral collodion must give as uniform a film as albumen, and not granulated like collodion. For large pictures, and especially landscapes, the 'grain' of collodion is not objectionable, it give more lightness and atmosphere to the picture; but for negatives of small dimensions, the fineness of the sensitive film can never be too great.

The mineral collodion can never present the greasy aspect of our present collodion, which is the cause of so many spots and failures; and this characteristic will facilitate, under all circumstances, its absorption and washing, to operate with it in the dry state. In this state some facilities will be required to preserve its sensitiveness. Ordinary collodion acquires a horny nature very rapidly, which impairs its porosity; with the mineral collodion we may expect that the water will leave it very slowly, and that its porosity will continue indefinitely.

The solvent of the mineral collodion being water, a very great facility will exist for adding the salts intended to produce a given effect, and doubtless it will adhere very tenaciously to the glass plates.

Photographers and astronomers are on the *qui vive*, making their preparations to observe the eclipse of the sun of the 31st December next, to which the recent discoveries by MM. Bunsen and Kirchoff in celestial chemistry impart a new and additional interest.

One point to which observation will be specially directed, is the examination of the spectrum of the corona, with which the moon will be surrounded for a moment, in that portion nearest the sun, to see if this aureola exhibits an inversion of the ordinary solar spectrum, or not, that is to say, whether Frauenhofer's rays will be replaced by brilliant lines.

Since the publication of the labours of MM. Bunsen and Kirchoff, the question of a solar atmosphere has acquired a basis, and is susceptible of proof by direct experiment. If, for example, the spectrum of the aureola which will be produced on the 31st December next exhibits to us an inversion of the solar spectrum, the much vexed question will be solved, and the existence of a solar atmosphere will become a definite scientific fact. If the contrary should be the case, we may be compelled to admit that absorbtion takes place in the substance of the photosphere, the surface of which emits, not only all the rays, but which doubtless contributes to the light of the sun by a part of its thickness; whichever it may be, the experiment is not impracticable, as it has already been performed. Sig. Fusinieri, of Vicenza, on the occasion of the magnificent solar eclipse of 1842, analysed the spectrum of the aureola. It appears, however, that he did not attach that importance to it that recent discoveries have now rendered evident. He contented himself with remarking that *green* was entirely absent from the spectrum of the aureola. The season at which the coming eclipse takes place does not encourage the expectation of fair weather; but we *hope for the best.*

MODIFIED RESIN PROCESS.

5, *Aberdeen Park, Nov.* 1*st*, 1861.

Dear Sir,—During the last fortnight, I have been making experiments with gum guaiacum as regards its use in the dry processes. I prepared the plates by two methods.—1st, adding the gum to the collodion; 2nd, coating the sensitized plate with an alcoholic solution of the same. The result in both cases was fine, brilliant, and intense negatives, and the film is so hard that any deposit may be rubbed off without any danger of tearing. I myself give the preference to the first method, as it is rather more simple than the second. The only thing to be determined is the keeping qualities of the plates, and whether the gum has any action on the nitrate bath.

I give my manner of working, as I think it is the best for securing successful results. First, Dissolve gum guaiacum in alcohol, filter, and add to suitable collodion, (I used Ponting's,) in the proportion of one grain to an ounce of collodion, well shake, and allow it to settle for two or three days. Having coated and sensitized the plate, which must be perfectly clean, place it in a dish of *distilled* water, until another is ready. Now remove to a large pan of water, and let it remain there for half-an-hour, then finish with a few drams of distilled water; dry by artificial heat.

Expose about the same time as for a tannin plate; thoroughly wet the plate, and develop with pyrogallic acid, 3 gr., citric acid, 1 gr., acetic acid, ½ dram, water, 2 oz.; though, I daresay, gallic acid and protosulphate would answer, but I have not as yet tried them.

Having poured the developer over the plate till all greasiness has disappeared, add a few drops of a 20-grain nitrate of silver solution. When all detail is brought out, add more nitrate, till the requisite intensity is gained. Fix in hypo, and when the plate has been well washed and *dried*, float it with alcohol to dissolve out the small quantity of gum, which, if allowed to remain, would render the plate slightly opaque: dry and varnish.

Second. Having proceeded in the same manner as in the preceding, but without the gum in the collodion, as far as the final washing, place the plate in a dish of alcohol till the greasiness disappears, then remove it, wipe the back, and coat it with a filtered alcoholic, 2 gr. to an ounce solution of gum guaiacum.

Expose, develop, &c., as in No. 1.

No. 2 will be most suitable for those who only wish to try a plate; but it is diffcult to get an even coating of the gum. Hoping your experimental readers will give this process a trial, I am, your's respectfully, H. Cooper, Jun.

DAGUERREOTYPE ANTICIPATED.

Dear Sir,—I read in a recent number of your valuable paper "Electric Telegraph anticipated," and thinking that the above title may also be of some interest to your numerous readers and my brethren photographers, I beg to state that in a French book, "Les fables de Fenelon," which has apparently been written for the education of the Duc de Bourgoyne, grand son of Louis XIV., in an able composition under the name of "Voyage supposen 1690," and amongst the many wonders of which the fable is made up, we read:—"Il n'y avait aucun peintre dans tout le pays, mais quand ou voulait avoir le portrait d'un ami, un beau paysage, ou un tableau qui representât quelque autre objet, on mettait de l'eau dans de grands bassins d'or et d'argent; puis ou opposait cette eau a l'objet qu'on voulait peindre. Bientôt l'eau, se congelant devenait comme une glace de miroir, ou l'image demeurait ineffaçable. On l'emportait ou l'on voulait, et c'etait un tableau aussi fidele que les plus poli glaces de miroir."

There was no painter in the whole country (the Island of Wonders); but when the people wished to have the likeness of a friend, a fine landscape, or a picture representing some other object, they placed some water in large basins of gold or silver, then they brought this water opposite the picture they wished to take. Soon, the water in congealing became similar to a looking-glass where the image of that object remained fixed; they carried it where they wished, and it was a picture as faithful as if reflected from the best polished looking-glass.

How far from thinking, the noble and virtuous Fénélon must have been, when writing the above, that such a fabulous wonder might one day be no longer a fable, but a reality!!!

How glorious is the art through which such wonders are operated!!! C. de Langue

Swansea, October 23*rd*, 1861.

Photographic Notes and Queries.

Tannin and Tobacco.

Mr. Editor,—One of your contributors informed his brother photographers that cotton wool, "*steeped in a solution of tannin, will remove all the nausea and hot flavour of tobacco.*" As a smoker, and reader of your valuable paper from its first number, I beg to inform you that I steeped cotton wool in a strong tannin solution, and applied it as directed, but it failed to produce the effect desired.

As I am a *cigar* smoker, preferring a pipe could I meet with an antidote for the heat and nausea named, I should esteem it a great favour if you could give me a hint on the subject, and oblige, yours respectfully, Henry Rose.

Newcastle-on-Tyne, October 22*nd*, 1861.

[We know of no method of obviating the "heat and nausea" produced by tobacco, except avoiding its use where these results are produced. Rejlander showed us one day his fine photograph of "The Goddess Nicotina," a shrivelled old hag, hiding her hideous face with a fair mask, as she offers the fragrant weed to a youthful votary. We asked him, "Do you smoke?" With a comical shrug, he answered, "I do." We feel a somewhat similar feeling to Rejlander in suggesting this mode of avoiding the unpleasantness referred to. But we never smoke when it causes "heat and nausea." That should be a sign to any one that it is injurious. But this is not photographic! —Ed.]

Preserving Prints.

Mr. Editor.—It is a source of grief to me to know that photo graphs, as a rule, fade and decay.

One great cause of this arises from atmospheric influence, damp, noxious vapours, &c., &c.

It has often struck me, that the most effectual way of checking this would be to use sheet gutta percha, about the thickness of four-sheet mounting board, cut about a quarter of an inch longer than the glass; place the mounted photograph face to the glass, put a piece of card against that, reverse all three on the sheet gutta percha, warm the edges, and lap them over on the glass.

"Where can I procure the kind of sheet gutta percha I require?"

The edges of the glass may be roughened, or varnished, to make it adhere, if there should be any difficulty in that.

I want to see the air perfectly excluded from the photograph—hermetically sealed.—I am, Mr. Editor, yours faithfully,

Cheltenham. AN ARTIST.

BLACK PAPER FOR TRANSFERS.

SIR.—Can you, or any of your correspondents, put me up to way of making black albumenized paper?

I want it for transferring glass positives, as I cannot procure any glazed paper of a sufficiently fine surface at any stationer's in this place; and it strikes me if a black albumenized paper could be made it would answer admirably.

I have tried the process, given in the NEWS some time back, of making black glazed paper, but it does not answer my process of transferring, being prepared with oily substances.

I think, sir, if you will kindly insert this application, some of our friends will assist me; or perhaps inform me where a good glazed paper suitable for the purpose may be obtained,—I am, sir, your obedient servant, J. C. V.

[Albumenized paper may be sensitized and then blackened by light. We know of no better method.—ED.]

COMMON WATER FOR THE SILVER BATH.

SIR,—In your notice "To Correspondents," my attention is just drawn to your reply to M. D. in this week's paper. In division 3 of that answer you state "Mr. Fry published a method of making the silver bath so that it should *not discolour*, which consisted in the use of common instead of distilled water, and never filtering out the precipitate; but always leaving it in the bottle, and shaking up with the solution."

Allow me say that I am unfortunate enough to find that this is an entire mistake. About ten days since I set up a new bath for printing, and used *common water* instead of distilled, with 90 grains of silver to the ounce, and a few drops of acetic acid (about 5 to each ounce). I was induced to make my bath thus as I had heard it would be so simply cleared, by merely shaking up the precipitate and allowing it to settle after using the bath with albumenized paper, that the precipitate would carry down with it, in fact, all impurities and discolouration. I had pleasing visions of no more kaolin, no further use of filtering paper, and loss of silver thereby, no washing of filter after every preparation of paper. I made my bath *in quantity* double what is needful for filling sufficiently my porcelain tray, in order that I might pour as much as was required out of the bottle, without disturbing the sediment at the bottom, and filtering it, mixed with the fluid about to be used; but all is to no purpose. I used the bath first and last on Monday, and shook the precipitate well up (together with a fresh addition to keep up strength and quantity), with the fluid after use. Four-and-twenty hours after, I looked at it, it was *very yellow*, and beaded with little bubbles at the surface, which no exposure to the air would dispel. Before sitting down to write this, I have looked at it again, it is still *as yellow as ever*, and the air bubbles *as they were*. If five days won't clear it, I may reasonably infer no time will suffice; so that I must again revert to kaolin and filtering paper. I send this in the hope that, perhaps, you may be able to suggest some remedy; and if not, to warn any against being misled or disappointed.—I am, sir, yours obediently, D. H. F.

October 26th, 1861.

[We have never tried making the silver bath with other than distilled water ourselves, as we rarely make a new one, continuing to refresh the old solution from time to time. We know that in Mr. Fry's hands his method answers. But common water is a very vague term, and as it designates a very variable fluid, constant results can scarcely be expected. Mr. Fry does not add acetic acid, and that may in some cases tend to vitiate the result. We prefer a printing bath slightly acid with nitric acid.—ED.]

ALABASTRINE SOLUTION.

SIR,—The following Alabastrine solution is equal to any sold. Make a saturate solution of bichloride of mercury in distilled water. Take 2 ounces of this when clear and bright, and drop in 3 drops of strong ammonia; re-dissolve the deposit by dropping in muriatic tincture of iron, from 12 to 20 drops, more or less; let it stand a short time, and remove the red colour by adding 3 drops of nitric acid.—Yours very respectfully,

JOHN HUDSON.

62, *Queen Street, Hull, Nov.* 4, 1861.

IODIZING THE BATH.

SIR,—Would you be so good as to tell me why it is that when I strengthen my bath, by the addition of silver, from one of the first establishments, the plates for the first minute or two after insertion begin to get creamy, as they should do; but when I remove them after two minutes, the creaminess has partly disappeared, and they become transparent about the edges; and if left a little longer in the bath, they become perfectly transparent. To correct this, I weakened my bath again by the addition of water, and experimented on several plates. They now remain longer in the creamy state, but not quite to my satisfaction.

What I wish to know is, whether it is the bath being too strong would cause this, or is it the insertion of experimental plates which partly restored the bath? This has happened to me more than once, and I cannot find it noticed in books on the subject.—Your's, &c., A SUBSCRIBER.

[We insert this note here, instead of answering it in another page, because we have reason to believe, from the queries which reach us from time to time, that the subject is not understood by many young photographers. A certain amount of iodide of silver is soluble in a solution of nitrate of silver of a given strength; if the strength of the silver solution be increased, more iodide of silver will be dissolved. Thus when more silver is added to a bath, or when a strong fresh solution is added, it is well to put a large coated plate in the bath, and leave it there for an hour or two. The iodide of silver formed will quickly be re-dissolved, and by these means the fresh solution will become sufficiently saturated. By weakening the bath, its capacity for dissolving iodide of silver is lessened, and excess of iodide in a solution may be thrown down by adding water. Whenever the plate on removing it from the bath is found all transparent, or with transparent streaks, spots, or patches, the probability is that it arises from this cause: the solution is insufficiently charged with iodide of silver; and it will dissolve the iodide of silver formed in the film, unless the plate is removed as soon as the film is creamy, so long as it remains unsaturated.—ED.]

Miscellaneous.

THE EYE AND VISION.—Although we derive so much pleasure and obtain so much knowledge through the sense of vision, very few persons are really acquainted with the powers and peculiarities of the eye. Thus our range of vision is bounded by the projecting parts of the face. In relation to this Dr. Alfred Smee says:—"If the eye be steadily directed toward one point, it is sensible of the presence of objects over a vertical range about 121° and a lateral range of about 149°." But perfect vision is only obtained over a range of about 2° 18′, which in practice is in the relation to the distance of the object to be viewed as 1 to 25. Thus at 25 inches distant, a person will be enabled to read a word one inch long without the slightest motion of the eye, and at twelve inches distant a word half-an-inch long may be read in the same way. Where the optic nerve penetrates the eye, the retina is insensible to light, which causes a total loss of vision over about 6° 20′—the commencement of the insensible spot being 12° from the centre of vision. As the result of this there is a portion of the field of view, equal to one-eighth the distance of the object, which is utterly lost: and though it seems at first thought incredible, it is nevertheless true, that in regarding a range of hills eight miles distant, one mile of the range is not perceived by the eye.

Talk in the Studio.

Obituary.—We regret to announce the death of Mr. Clarkington, well known for many years past as one of our most enterprising and successful metropolitan photographers. During the period when the Daguerreotype was in the ascendant, he practised that process with considerable skill in the Strand. Subsequently he removed to the Quadrant, Regent Street, and obtained some reputation for a superior class of coloured glass positives, for which he had a large demand. His premises being required for the erection of St. James's Hall, he removed to the studio he occupied up to the present time, known as the "Sponsalia," Regent Street, the glass room and appointments being amongst the best in London. He took the tide of the "cardomania" at the flood, and has, we believe, been very successful in the production of public characters. He died on Saturday last, the cause being, we understand, disease of the heart.

To Correspondents.

Syrinx.—The acetate of soda and gold toning bath may be used immediately it is mixed; but it is usually better to keep it for 24 hours. There are many excellent points in the glass room to which you refer, and it is in the main right in principle. We cannot, however, criticise it in detail here.

G. H. C.—We cannot advise you as to the best and cheapest house for cardboard mounts, except by recommending you to examine our advertising columns from time to time. Questions of price do not legitimately come under our attention.

Puzzled.—We have not had an opportunity of trying the No 2 lens of the maker you name, but the No. 1 B of the other maker we are in the constant habit of using, and find its results, in all respects, perfectly satisfactory.

F. Lane.—The glass was safely received. The report will appear in the usual place next week. A hasty examination seems to indicate that it is satisfactory.

Inquirer.—The photoglyphic process is not, that we are aware of, practised commercially. We are not aware of any specific progress recently. Photolithography has made considerable strides, and for all purposes in which the subject is represented in lines or points, not in "tints" or half tones, it may be regarded as perfect. A stone would yield, we apprehend, considerably more than four hundred prints. See the specification of Messrs. Beattie and Alexander, in a recent number. The most promising carbon process of which we hear anything is Fargier's, described from time to time in our columns. The specimens by it, now exhibiting in the French Exposition are, we are told, very fine.

Aspirans.—The plan of increasing intensity in negatives by adding gutta-percha to the collodion, has long since been abandoned. The proper method of regulating the intensity of the collodion depends mainly upon the pyroxyline. Other circumstances will affect it, but any amount of intensity may be secured by suitable pyroxyline. The method of sensitizing, the condition of the bath, the kind of developer, will, however, materially modify results. Pyroxyline, made at a high temperature, and with weak acids, will aid intensity; the use of iodide of potassium, without much bromide, will aid intensity; organic matter in the bath, and in the developer, will aid intensity; but in all cases care must be taken not to secure intensity at the expense of half tone.

C. E. L.—On adding oxide of silver to a bath containing acetic acid, acetate of silver will be found. You can, after sunning the bath, add a little nitric acid if you please, that will just have the effect of decomposing the acetate of silver, and freeing acetic acid; the oxide of silver will then combine with the nitric acid and form nitrate of silver, leaving the bath, provided you do not add too much nitric acid, in the same condition as regards the nature and amount of acidity, as at first. The addition of the oxide in the first instance will, however, allow any organic matter present to be more readily thrown down by light.

F. Y.—The amount of subscription for the Photographic News and postage to Malta, for one year, will be 17s. 4d. Vol. 3 only can be had. Lamp black is better for painting out skies than indian-ink. The latter is a somewhat transparent pigment, the former is more opaque. We prefer masking a sky, where it is necessary, to painting out, as there is less danger, if care and skill be used, of getting hard outlines.

W. Bartholomew.—The parcel has arrived, and we will have pleasure in trying the plates and reporting upon them shortly. The others we tried and found very good, the development quick. We are glad you find the plan of developing without adding first, so satisfactory. It is our conviction that it will prove a very valuable aid to softness in all dry processes.

W. Larchin.—In the Photographic Exchange Club you can send any reasonable number of prints from the same negative if it be very fine. But as a general rule it is well to send variety. Send, in short, as many as you can of all your best pictures. If each member do this, a brisk and satisfactory series of exchanges may be kept up. You must write to the secretary to place your name on the list. We are glad our suggestion made your collodion give good results.

J. C.—If you find your lenses work satisfactorily, there is no reason for changing. We have met with many good French lenses. Our answers to correspondents who consult us as to what they shall purchase, have simply intimated that cheap French lenses might chance to turn out either good or bad, there was no certainty. Those purchased of the dealer you name will probably be made in France; but by whom we have no idea. The qualities will probably be variable. They have no reputation that we know of, either good or bad. 2, Those of the English maker you name will doubtless be much superior in every respect. 3. The most rapid lenses we know, or have tried, are the B lenses of the maker you mention. Of the specimens you enclose, the card portrait taken with the half-plate is the only one which speaks favourably for the lens. The others, if they are the best results as regards definition, which the lenses will give, suggest that they are very faulty. The card picture by the half-plate is very good indeed.

A. W. F.—Your manipulations, as described in your letter, are in the main right. The cause of fading is, however, probably imperfect fixation. One part of hypo in six of water is weaker than we like. One part in four or five gives the weakest solution desirable for safety. Five or ten minutes will be in many cases decidedly too short a time for immersion in the fixing bath, with many samples of paper. See our answer to M. A. last week. Take care that your hypo solution is fresh, and that the toning solution is not at all acid.

W. R. A.—The silver bath for working Mr. Richards's Albumen Process should be saturated with iodide. Whatever proportion of iodide of potassium you use, you can only saturate the solution; any excess will be precipitated, and must be filtered out. You will find the modification of the albumen process there given as simple and efficacious as any that has been published.

W. S. H.—We shall have a paper on the subject very shortly. Should it not be ready soon, we will write to you, and describe details. We shall have great pleasure in receiving the article of which you speak: the subject is very interesting, and not exhausted. We should be glad to know the lens with which the vignette sent us before was produced

E. H. B.—We have repeatedly described the method of forming oxide of silver, lately; but will once more repeat it. Add, a little at a time, a solution of caustic potash to a solution of nitrate of silver, until all the silver is thrown down. The precipitate will be a dark insoluble powder of a brownish olive tint, which is oxide of silver. Wash well in water to remove the nitrate of potash formed, and the oxide is ready for use. 2.—You will be perfectly safe in sending direct to the manufacturer you name. For his reputation's sake nothing will be sent out which is not as perfect as it can be made. Besides, he is a highly conscientious and honourable man.

J. T.—We are obliged by your communication, and the filtrate enclosed, which we will examine at leisure. The greatest evil which might have been apprehended, but which it appears you have not experienced, would arise from the large extent and diversified character of the adulterations, with which commercial cyanide is combined.

N.—We are obliged by your communication and the plate-holder. We see no reason why the letter should not appear in our next in its entirety; as the subject is necessarily interesting to a large class of amateurs. We will bring the model and the letter under the attention of some manufacturer. We will now examine the prints. The stains might unquestionably be caused by "contagion;" but that contagion is chemical action, and it is always worth while to ascertain, if possible, its cause. The print enclosed, excited on a 90-grain solution, is certainly not so rich as the others from a weaker solution; but were all the other conditions the same?

Stereo writes to express entire satisfaction with the new arrangements of the Photographic Exchange Club. The slides enclosed are very good: a little more warmth in tone, would be, however, an improvement. There is, however, a slight inclination to yellowness in some parts, which is suggestive of sulphur action, or imperfect fixation. Do you keep your hypo solution perfectly neutral? The prints of the professional photographer whom you name, are decidedly sulphur toned, and show rapid signs of fading. We are obliged by the other parts of your communication, some of which we will use.

N. X.—There are several modes of toning; but none so satisfactory in all respects as by gold. 2. Camera makers and lens makers generally reckon from the back lens when they are speaking of focus. The equivalent focus of a portrait combination lies somewhere between the front and back lenses, varying in position with the kind of lens. 3. If a lens cover a space of 5 by 5 perfectly, it will cover well for card portraits. 4. Moule's preparation for burning in the photogen is as good a white fire as we know: It is stated to be composed of nitre, sulphur, and orpiment; but in what proportions we do not know.

H. C. H.—The amount of capital required, and the amount of success which may be hoped for, depend entirely upon circumstances, to which it is impossible to refer in general terms. Much depends on the locality, on whether suitable premises are found ready to hand, or whether glass-house is to be built, &c., &c., &c. From £50 to £500 might be required in a moderate business; and with good work, and good business tact, there is, we believe, plenty of room for success.

W. S. Parry.—We are much pleased with the specimens received. The card portrait of the lady is decidedly amongst the very best we have seen. Soft, delicate, and vigorous, pure in tone, easy and natural in pose, expression, and general arrangement.

F. E. G.—You forget that several formulæ may each be right, all giving slightly different results, each operator selecting that which he likes best. The tones of the prints enclosed, are warm and pleasant. The horse pictures are good, but the lenses have been a little over-tasked, and apparently with full aperture. 2. It is impossible to tell you how much oxide of silver will be necessary to neutralize your bath, because we don't know how much acid is present. Add excess, and all that is not required will fall down, and can be filtered out. If acetic acid be present, acetate of silver will be formed. 3. To convert an old collodion bath into a printing bath, first precipitate the iodide with citric acid, as described in a recent article, and then boil gently in a glass vessel until it is reduced to half its bulk.

C. N.—The first maker you mention we consider best. Of those mentioned and numbered in the latter part of your letter, some are not makers, and we cannot speak with certainty of the others; but we have heard good accounts of that numbered 2.

A Searcher asks us to give him instructions how to take a good negative with the solutions required for doing so, and for printing. We can only advise him to read carefully the articles in our pages, from week to week, as the instructions he asks would more than fill a good many such columns as we devote to these answers. In working the positive process and intensifying with mercury as mentioned, the chief difference in manipulation between obtaining a positive and a negative is that the latter will require more exposure. In toning, use the gold solution first, and when the toning is completed, then fix with the hypo solution. If our correspondent will state his special difficulties, we will have pleasure in helping him; but we cannot do him much service when he asks in general terms how to take negatives and print from them.

Some other correspondents in our next.

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M. JOUBERT'S ENAMEL PHOTOGRAPHS.

The art of producing photographs enamelled, or burnt-in, on glass, patented little more than twelve months ago, has, in M. Joubert's hands been making steady and satisfactory progress since that time.

On Saturday last a number of connoisseurs and amateurs assembled at Porchester Terrace, by invitation from M. Joubert, to a private view of specimens illustrating the progress and present state of the art. The pictures consisted of between seventy and eighty examples of different styles, comprising reproductions of photographs, portrait and landscape, and of copies from engravings and lithographs, in some cases produced direct from the print, which has been made to serve as the *cliché*, and in other cases from photographs of the prints. They were arranged around M. Joubert's glass-room in contact with the glass, giving a highly ornamental effect of illumination, not easily distinguished from that of stained glass.

The most striking advance which has been made, is in the successful production of a variety of colours. We have remarked in former notices that so far as the production of enamelled transparencies in monochrome was concerned, considerable perfection has been attained. In this respect there is an accession of delicacy and detail; but as regards the question of colour, the progress has been very great, many of the specimens presenting the effect of exquisitely coloured paintings on glass. To some extent, indeed, they must be regarded as such, being literally tinted photographs in enamel colours. Those of our readers who have taken any interest in the process, will remember that the image is first produced by the action of light, through a *cliché*,* on a preparation of some of the chromic salts and organic matter, such as albumen, honey, &c. The effect of this is to produce a slightly indicated image, which is made fully visible, or as it may be termed developed, by the application of a very finely powdered enamel colour. This powder adheres to the parts which have been protected from the action of light just in the direct ratio of that protection. On the lights of the picture, where the light has acted fully, the preparation has entirely lost its adhesive or sticky character, and the powder does "take" to those parts; where the light has acted slightly, a slight amount of powder adheres; and in the deep shadows, which have been perfectly protected by the opaque parts of the *cliché*, the greatest amount of powder, giving the greatest depth of colour, becomes intimately combined with the preparation. We have briefly referred to the principle of operation, in order to explain that, in a variety of ways, a skilful manipulator may, instead of using one powder of one tint, apply many, each in its proper relation, in fact, producing on the photograph an enamel painting. It is unnecessary to enter here into a consideration of the modes which may be, or are, adopted in effecting this, or of the method of dealing with the pictures in many colours in the process of burning in. We merely wish to illustrate how it is that enamel photographs can be produced in the varied tints, which rival painted glass in brilliancy and colour, whilst they far surpass it in truth, and also in facility of production and cheapness.

There were some good specimens of portraiture; but we do not consider that in this department the strength of the process lies. Transparencies, either in colour or monochrome, are not suited to portraiture, their especial object being for purposes to which we consider portraits entirely unadmissible. We can scarcely understand the sentiment which would place the portrait of one well-loved or much-esteemed to the "base uses" of ornamenting a lamp-shade, or ornamenting a library window. The portraits here exhibited, however, show the capabilities of the process in rendering whatever may be in the negative. A striking and effective portrait of the late Douglas Jerrold, from a negative by Dr. Diamond, is amongst the specimens.

Amongst the specimens which favourably illustrate the suitability of the process for the reproduction of figures are copies from several of the well-known and highly artistic *genre* groups of M. Silvy. One of them, already familiar to photographers from having been issued as a specimen of M. Joubert's "phototype" printing process—the "publication of an *Ordre du Jour* in Paris during the Italian war"—is very excellent. The fine light and shade which distinguishes the original picture is accurately reproduced, the most exquisite transparency distinguishing the deepest shadows. A group entitled "Spring," and another "The Savoyards," both photographed from nature by M. Silvy, are also very fine.

Amongst the most successful landscapes are some from photographs by Mr. Mudd. Of these we have in one instance the reproduction in monochrome, and a second in natural colours. The subject is a "Scene in Lancashire." We have before seen some of Mr. Mudd's pictures coloured, and remember to have observed that we preferred the untouched photograph to the effect then produced. We are bound to say, however, that here the colouring is a great improvement. Some slight additions in making out form have been made by the artist in colouring, but without interfering with the keeping or *vraisemblance*. The subject is an autumnal landscape, in which the rich warm browns, yellows, and greens, prevail in all varieties, and present no indication whatever that the process is bound by a limited scale of colour. Wortley Hall, Lancashire, is another effective reproduction from one of Mr. Mudd's pictures.

Amongst the miscellaneous reproductions of photographs from nature, one of the finest is a view of Dordrecht. This is an exceedingly satisfactory picture, with an excellent atmospheric effect. A "Shady Lane in Surrey," is also very good. A group of sheep, coloured, and in monochrome, may be regarded as amongst the most successful and pleasing pictures exhibited. The coloured group, which is worthy of Sydney Cooper, appears to have required comparatively little work from the hands of the artist, the admirable tint in which the uncoloured picture is produced, so pre-eminently suits the character of the subject. A "Quiet Dell in Yorkshire" is very pleasing. A "Scene at Bayswater," is an excellent picture, and a very fine enamel. "Dead Game," is a fine specimen of the rendering of delicate half tone. "Lincoln Cathedral" illustrates the admirable suitability of the process for architectural subjects: this is an exceedingly good picture, and leaves nothing to be desired.

On the whole we prefer the reproductions from photographs to those from engravings. Of the latter there are, however, some very fine examples. A very charming picture, apparently from a lithograph, is a "Mare and Foal." This is a coloured picture, but has apparently not required a great deal of labour from the hands of the artist; the dappled grey of the mare being beautifully rendered by the neutral tint of the enamel.

* We adopt the useful French term, as more suitable here than the term negative, a transparent positive being really used as the source from which to reproduce.

An especial feature of the uncoloured pictures is the variety of tones which prevailed, varying from tints of sepia and bistre to black. In many cases the application of these tones was pre-eminently well suited to the sentiment of the subject, and thus gave great value to the picture. This is a point to which too little attention is given by photographers, many of whom are in the habit of aiming at one especial tone, which is adopted in all cases, for the portrait of a delicate blonde, as well as that of a swarthy brunette; for a landscape in the early grey of morning, or the mellow warmth of evening, and representing spring or autumn, summer or winter. The suggestive value of tone is thus often entirely overlooked, and an important element of effect quite lost. The subject is well worth careful attention, and we take the opportunity in passing, to commend it to the thoughtful and artistic photographer.

If any of the specimens fail at all in effect, it is, we fancy, where the original was not either good in itself, or well suited to the process. Perhaps the chief matter for surprise is not that any of them should be from inferior photographs, but that such a number of excellent specimens should have been produced in a short time. We hope that the variety of subject indicates a rapid and remunerative demand for such transparencies.

Regarding the purposes to which these transparent enamel photographs can be, or are intended to be applied, it is unnecessary to enumerate. For almost every use to which painted or ornamented glass can be applied, we apprehend these photographs are equally applicable, and will, we conceive largely increase the use of pictorial transparencies for decorative purposes. Some elegant specimens of the application of these transparencies on white enamel glass, to lamp shades, were amongst the objects exhibited, and from what we learn, Messrs. Claudet and Houghton, who have undertaken their manufacture commercially, have already a good demand for them. The permanency of the pictures, and the possibility of subjecting them to all treatment to which glass may be properly subjected, are, we believe, undoubted. We congratulate M. Joubert, on the rapid and successful progress he has made, and on so speedily having brought his process to a state of perfection, which appears to warrant a hope that it will steadily take its place amongst the regularly practised arts with a fair share of commercial success.

EBONITE FOR PHOTOGRAPHIC VESSELS.

We have recently had our attention called to a new preparation of india-rubber, called Ebonite, which seems to possess all the peculiar characteristics necessary in vessels for photographic purposes. It is light, rigid, tough; it is not liable to breakage, it is not acted on by alkalies, nor by the various salts used by photographers; it resists all but the most concentrated mineral acids, and it is not affected by a temperature as high as that of boiling water. It appears to possess the hardness of ivory, without its weight or frangibility; and is just as capable of being turned and polished. Its applicability to various purposes of use and ornament appears almost without limit, but it is to its especial application to the purposes of the photographer we now direct attention. After its mechanical suitability, which is undoubted, the next important consideration is, how far it is acted on by a solution of nitrate of silver. On that point we think the report is most satisfactory. In the first place it comes under our attention with excellent credentials. We have seen a letter from Mr. Hockin, photographic chemist, in which he describes the various tests which, by the desire of Messrs. Silver and Co., he submitted vessels made of the material. A nitrate bath was placed in one of the vessels and maintained at a boiling heat for an hour and a half. It was then again cooled, and a collodion plate excited in the solution. The resulting picture showed that no change, whatever, had taken place in the photographic capacity of the bath. This was a severe test, and a tolerably conclusive one. In our own experiments, we have simply subjected the vessels to the same treatment as they will meet with in the ordinary practice of photographers. After satisfying ourselves that the material was innocuous, we made up a new bath consisting of about seventy ounces of solution, containing five ounces of nitrate of silver. This was slightly acidified with acetic acid, being intended for dry plates, and has now stood in the ebonite bath for a few weeks. We have, from time to time, since tried a plate, without finding the slightest deterioration in its qualities, the pictures being clean, rapid, and brilliant. Had we not been satisfied in the first instance, we should not have risked the spoiling of seventy ounces of silver solution.

Ebonite is an improvement upon a form of india-rubber, which has been some time before the public as vulcanite. This material has been found unsuitable for photographic purposes, from the presence of sulphur. In the preparation of ebonite, sulphur is, we understand, used; but the bulk of it is again eliminated in after processes; not more than two per cent., at most, remaining, and that so completely insulated as to be innocuous. Baths, dippers, and trays, are already made of this material, and it is possible that it may be found useful for other articles in photography: it has been proposed to substitute it for brass in the mounting of lenses. Those of our readers interested in electrical or galvanic experiments will find this material invaluable. As an insulator it is unsurpassed, and is the best material for battery cells which we have seen.

As our readers are aware we have always maintained that pure gutta percha was without action on nitrate of silver; its liability to adulteration, and the consequent uncertainty have been therefore the great draw-back to its use. In the case of ebonite, we believe there will be immunity from this danger, as the material, unlike gutta-percha, cannot be worked after it leaves the manufacturers' hands. After once undergoing the treatment which confers on it its peculiar qualities, it cannot again be made plastic. At present, therefore, there is no probability of spurious or adulterated forms of the material coming before the public, its manufacture being confined to the inventors, Messrs. Silver & Co., whose own interest in the matter, as well as their position, will preclude any fear of an inferior article being sent out.

PHOTOGRAPHY AND THE EXHIBITION.

The *Daily Telegraph*, in one of its able and interesting articles on the progress of the Exhibition and its arrangements, has the following:—

"By a hasty and ill-contrived arrangement, the blame of which rests pretty equally between the official authorities and the particular class of exhibitors interested in the question, photography will stand in a very exceptional and disadvantageous position in the industrial display of 1862. The original purpose of the commissioners was to class this new art with machinery. An outcry amongst its followers was raised with such effect as to procure an amendment of the plan, or rather a withdrawal of the obnoxious classification. A separate department was promised for photography. Meanwhile, the great mass of English photographers had, by their parent society, declined to appoint a committee; and, allowing their first feeling of mortification to influence their conduct for too long a time, they lost ground which may never be recovered. The appointment of Mr. P. Le Neve Foster to the superintendence of class 14, is accepted on all hands as a beneficial step; but photographers are now beginning to discern the importance of having a reliable body of gentlemen to represent so large an interest as they have in the International Exhibition of 1862. One of the most influential sections of the great modern guild, the South London Photographic Society, has memorialised the Commissioners on the subject, explaining their motives for desiring to be thus represented. We think their request, late as it comes, a fair one. Unless more decided steps are taken than have yet been indicated, British photography will not hold a very creditable position by the side of such a display as we have reason to expect from France, from Belgium, from Austria, and from all parts of Germany. It is a consideration, further, to be taken into account, that the practice of photography has received governmental aid abroad, and has been fostered to an extent not aimed at in this country. When we see those grand architectural pictures by the Brothers Bisson, we may be sure that accurate representations on so large a scale are not achieved without the aid of a costly apparatus. Indeed, it is a known fact that such a lens as that employed to photograph Rouen Cathedral and the porch of Notre Dame, costs from five hundred to a thousand pounds, or even more. To enable photographers to meet these vast expenses, so far beyond their ordinary means, the French Government comes forward with liberal grants of money. It is hardly necessary to say that State assistance in such matters does not accord with English notions. But this is all the more reason for extraordinary efforts to cope with the favoured art of other nations.'

In some of the above remarks our contemporary is a little inexact. A committee, as we have stated, is in course of formation, who will co-operate with Mr. Peter Le Neve Foster, to whom is intrusted the superintendence of the department: so far as there is any intention at present, therefore, photographers have no reason to fear that their productions will be handed over to the sappers and miners, as has been suggested. Mr. Foster is now at Florence, visiting the Italian Exhibition; and as photographs form an important feature there, some valuable suggestions as to arrangements will doubtless be gained. Regarding the remark as to the immense cost of such a lens as that used by Messrs. Bisson in their architectural work, our readers will at once see there is some misconception. Even were it true, English photographers desire no governmental subsidies: they simply require fair play; "a clear stage and no favour." There is no doubt whatever, but each nation exhibiting will excel in its speciality. But until there is proof to the contrary, we are unwilling to believe that this country will occupy the least distinguished position in the coming competition.

Scientific Gossip.

We have already drawn attention to the dangerous impurities existing in some of the pumps from which the poorer (and in many cases those well off) inhabitants of the city, draw their daily supply of this necessary. Dr. Letheby has just completed analyses of several more of the well waters, and with almost uniform results; in only two instances do they furnish water fit for human consumption. It behoves our city artists to keep these facts prominently before their minds, for all experience shows that the organic and mineral impurities present in water, are even more injurious to a photograph than to its living representative, although their effects upon the latter are sometimes very serious. Indeed, it may happen at any moment that a city well may become the receptacle for the leakings of a cesspool, or a sewer, and in that case it would be almost as dangerous for the photographer to take a draught of his cyanide of potassium solution, as a glass of the cool, bright, and sparkling beverage supplied by the treacherous pump. Several terrible instances, to corroborate this, are given by Dr. Letheby. In the autumn of 1854, there was a sudden and serious outbreak of cholera in the parish of St. James's, Westminster. The course of the disease was confined to a small area in the neighbourhood of a favourite pump, in Broad Street; and soon it was remarked that of seventy-three persons who died during the first days of the visitation, sixty-one had been drinking the water of the pump. It was also remarked, that among persons who were living in the same street, and occasionally in the same houses, those only were attacked who drank the favourite water of the pump; and, furthermore, in a number of cases which were particularly investigated, it was ascertained that persons who lived at a distance from the parish, and who had the water sent to them because of its supposed goodness, were seized with cholera, and died. A full enquiry into all the circumstances of the matter proved that the well had become charged with cesspool drainage, and had thus acquired its poisonous action. The pollution had perhaps been going on for years, and yet the water had not betrayed it, and had been drunk with comparative impunity; indeed, its cool and sparkling qualities, the fatal fascinations of corruption, had gained for it such a high repute in the neighbourhood, that it was a favourite water, and was generally drunk. Many similar illustrations are given by Dr. Letheby, to prove the danger of continuing to employ these waters, which, contaminated as they are with the refuse of drains, and the soakings of grave-yards, are unfit for public use. The pumps should instantly be removed, and their places supplied with drinking-fountains.

Chemistry has just conferred a great boon upon the artistic photographer, in the form of a rich and brilliant yellow pigment, which is possessed of all those qualities which are considered necessary to form a perfect colour. The new colour is termed aureolin, it is a chemical compound of as definite a character as nitrate of silver, and is of interest to the scientific man, equally with the artist, on account of the remarkable combination of good qualities which it presents. It is the nearest known approach to an elementary yellow, resembling the pure tint of the solar spectrum, nearer than any other known colour. Its tints, especially the lighter ones, are extremely delicate and clear; it combines with other colours in a very perfect manner, forming with blues a magnificent range of brilliant greens. With ultramarine, and madder red, aureolin completes a triad of *brilliant*, *permanent*, and *transparent* primitive colours, as it possesses these invaluable qualities in a very eminent degree. It has an advantage over all other yellows in its tints, being of wondrous delicacy and beauty without any intermixture of other colours; yellows generally bordering on a buff or orange tone, or on a greenish tinge, or they degenerate into various shades of brown. The transparent yellows, in addition to these defects, are generally very fugitive, and the permanent ones are opaque. But aureolin possesses other claims upon the notice of artists. It is absolutely indestructible and unalterable by any atmospheric agency. Several of our first chemists have experimented upon it with a view to ascertain its behaviour with chemical tests, and they report (and in this we can corroborate them) that aureolin is unchanged by sulphuretted hydrogen, or any gaseous impurities which ever find their way into the atmosphere. Long continued action of light has likewise no fading influence upon it, as samples have been exposed to the direct rays of the sun during the whole of one of our late intensely hot summers, without the least injury to, or diminution of, its delicacy of tint. Neither is it affected by, nor does it affect, any pigments with which it may be mixed.

At the last meeting of the Chemical Society some interesting facts connected with the metallic impurities present in commercial copper were communicated by Messrs. Abel and Field. This metal is frequently contaminated with arsenic, antimony, iron, tin, bismuth, silver and lead, but the usual methods of separating these impurities are very untrustworthy. Several details were given of improved analytical methods whereby the hundredth part of a grain of arsenic, or antimony could be detected in the presence of a hundred grains of copper. These results are very important, for chemistry is daily discovering that elements hitherto considered rare or sparingly diffused are to be found plentifully, if only proper search be made for them. Of these elements arsenic is one which is most frequently met with in the ordinary chemicals; and it is of the utmost importance to toxicologists that they should be in possession of ready methods of ascertaining whether their copper is contaminated or not with the very metal for which they are searching. It is now generally believed that some, at least, of the older discoveries of arsenic in supposed cases of poisoning were derived from the very impurity present in the chemicals employed in the research.

It is customary with druggists, and also with some unscien tific photographers to employ blue glass bottles for the purpose of counteracting the effects of light upon chemical and organic substances. In reference to this custom M. Dumey has recently called attention to the fact that such glass has no action on the chemical rays, and that blue glass is no better than white glass for that purpose. But excellent results are obtained when *red* glass is employed, as the most easily affected substances undergo no change from the action of light when kept in red glass bottles. We have long used yellow glass bottles for this purpose, but have experienced some difficulty in obtaining them of that particular shade which is necessary for the complete obstruction of all the chemically acting rays. Our researches in this direction with the spectroscope have shown us that this difficulty does not exist with respect to red glass, and that there is no difficulty whatever in obtaining in this material a perfectly *adiactinic* medium. From observations in our laboratory we are of opinion that not only should the more decidedly sensitive agents be preserved in bottles of this kind, but that benefit would be derived by enclosing every chemical used in photography in red glass bottles. Whilst speaking of bottles for laboratory use, our readers may be pleased to hear of a very simple contrivance which has lately been brought before our notice for the purpose of preventing the adhesion of the stoppers of bottles containing caustic solutions and other chemicals, which act upon glass after long-continued contact. Sometimes grease is employed for this purpose, but owing to the chemical properties of this substance it is soon attacked and rendered worthless by the caustic liquid, and, moreover, this latter is injured by the introduction of fatty acids. Now, paraffin in the solid state has been proposed as a very perfect lubricant for the contact surfaces of the glass, as, owing to its chemical passivity, neither caustic alkali, nor most other substances, act upon it.

A specimen of glass from F. L. cuts off all the blue and a great part of the green rays. It may be used with perfect safety except when strong sunlight is on the window, and a bromo-iodized collodion is used.

PRINTING-IN SEPARATE SKIES.

BY F. MAXWELL LYTE, F.C.S.

SIR,—The following letter was written in refutation of a critique on my pictures, lately exhibited at Brussels, and which I can hardly allow to pass unnoticed, as notwithstanding the flattering testimony which the writer bears to the artistic feeling displayed in them, the fault of which I stand accused would show that I was really not an artist at heart, and totally ignorant of the laws of composition.

It is stated that my pictures, though possessing much artistic excellence, are entirely devoid of harmony of purpose, or unity of effect, and that all this arises from my system of printing, by stopping out skies, and the introduction of clouds by means of a separate negative; the result being a hard outline on the horizon, and incongruity of effect. On the other hand, it is considered that the introduction of the same sky into several different views is wrong, and cannot but be fraught with disastrous effects, as exemplified in my pictures. Now, as the same pictures have been exhibited this year in London, Edinburgh, Paris, and Brussels, many of your readers will have had the opportunity of judging for themselves as to their merits.

I do not insert this note in defence of my own particular works, but in defence of the general system I adopt, which I believe I was one of the first to put into practice, having employed it in my pictures ever since the year 1853. I propose then to deal with the two points above mentioned, *seriatim*.

It is stated, first, that my pictures exemplify the fact that made skies (*ciels rapportés*), can never produce an artistic effect, and are always inferior to those naturally produced in a negative.

That my skies are many, indeed most of them, printed from a separate negative, is quite true, as may be gathered from a paper on photographic printing written by me, read before the Photographic Society of Scotland in the beginning of this year, and published in your columns.

So far then we agree to differ; but in order to understand whether the natural sky of a good negative is better, or worse, than one printed in afterwards, we must consider the nature of a collodion picture.

When a sensitive collodion plate is exposed to the light, and subsequently developed, it will, if the exposure has been sufficiently short, or the light sufficiently weak, present a dense black surface, almost absolutely impermeable to light; but should the exposure have been very prolonged, or the illumination too strong, solarization, as it is called, takes place, and the developed film takes a reddish violet tone after being fixed, and remains more or less permeable to actinic rays. Now in the production of a negative collodion picture of a landscape in the camera obscura, the sky, which is by far the most actinic and brightest portion, becomes almost invariably solarized before the exposure has been enough prolonged to reproduce the details in the deep shadows. The consequence is, that an operator's choice lies between two things, viz., the solarization of his sky, or the necessity of intensifying his picture by repeated doses of nitrate of silver added to the developer, producing what is technically known in the art as "*soot and whitewash*." It is true that by a cautious addition of bromide, and the use of salts of sodium in the collodion, by care and patience in the development, and by careful adjustment of the nitrate bath, solarization may be somewhat got rid of, but in a general way it always becomes necessary to solarize the sky before we can obtain a harmonious landscape.

A solarized sky is transparent, and prints dark.

Anyone who has studied nature, especially in mountainous countries, will have observed that the blue vault of heaven gradually fades to a paler hue as it approaches the horizon, except where some giant peak rears its head into the sky, and there the outline appears cut out sharply on the dark blue, whereas on the ordinary horizon, and especially at the end of the valleys, a whiter hue prevails.

This is what I try to obtain in my pictures as general effect, varying it from time to time to suit particular occasions.

And now we come to the second point, viz., that I have used the same sky for several different views, taken at separate times and places. I allow this to be the case, but refute what the writer says as to its disastrous effects, and will explain the reason of the apparent anomaly.

The valleys of the Pyrenees, with but few exceptions, run from north to south, and are consequently only lighted obliquely morning and evening. This oblique lighting is necessary to produce real artistic effects, with lights and shades, and to give real value to the different planes of distance. In the morning the air is almost invariably still during fine weather, but during the day the sun rarifies the air in the valleys, which, consequently, ascends and draws a draught of air up from the north, which reaches up the valley as it would up a chimney. This northerly breeze blows all day, and ceases again at night, with astonishing regularity, and generally finishes by driving up moist air from the plain, which condenses on the mountain, and produces cloud towards the afternoon and evening. Again the heat of the sun usually appears during the day to raise vapours, which although they may not even condense to cloud, interpose a sort of blue veil of mist, of a most anti-photographic nature, between us and the mountains.

Knowing these obstacles to exist, I always make it a point to be on my ground, if possible, and at work at an early hour, and more than nine-tenths of my pictures are consequently done by morning light, between the hours of five and eight, and the others are done, with scarcely any exception, by evening light. I have various negatives of clouds, taken in various positions of the sun, and it so happens that one of these is especially suited to the position of the light during the time at which I ordinarily work. This sky has, therefore, appeared on several different pictures, but never, I hope, with that incongruity of effect for which the writer of the critique gives me credit.

As to the sharp outline of the mountains against the sky, the writer should come down to the Pyrenees, and he will find that effect to be most frequent in our clear atmosphere, and on re-examining my pictures, he will see that I have been peculiarly careful in their treatment to convey the effect of distance, by the different tones given in the several planes, those at the extreme distance almost blending with the sky, and the nearer and taller mountains cutting out hard and vigorous. At the same time I have aimed at the production of a shaded sky, to blend in with the rest of the landscape, rather than a hard white one, or the dull monotonous discolouration, and the want of effect which would result from the printing-in of a plain solarized sky. Lastly, I may observe, that with the light coming from behind, even if the direction in which it falls be oblique, the clouds which can come within the range of the camera, can rarely, if ever, affect the lights and shades of a landscape, so that if the position in which the light falls on a cloud, harmonizes with the direction in which it strikes the landscape, the printing-in of a separate negative of such clouds can produce no incongruous effect This is just the position of light most favourable to the production of a good photographic picture, and the one, which as I have already explained, I, of necessity, almost invariably employ.

Bagnères de Bigorre, Nov. 4, 1861.

[The criticism which gives rise to these general remarks appeared recently in an able French contemporary, the *Moniteur de la Photographie.* The critic has fallen into a very common error, thinking the *use* of a principle or practice must be bad because it is possible to *abuse* it. Our readers know our opinion on this subject; we repeat it—success is the test of legitimacy. Those who remember Mr. Lyte's magnificent pictures in the last Exhibition of the Photographic Society in London, will be in a position to judge of his success. So far as our memory serves us at the present moment, it was complete; we do not remember one picture which was not exceedingly fine in harmonious atmospheric effect.—Ed. Photo. News.]

PHOTOGRAPHY AND ITS STUDENTS.

BY SAMUEL FRY.

With the large field opened by photography, both for amateur amusement and commercial enterprise, it would only be a reasonable anticipation that one would find a large variety of men and minds devoted to it.

Photographers as a body are loquacious, some have said gossiping; but I think the former word preferable; for certainly, if they do a good deal in the talking way, it is seldom without a good end in view; and how, if these matters were not well discussed, could any conclusion be arrived at? But in the mere talking part, what different characters do we come across; the unfortunate, unlucky, fellow who declares he mixed his bath according to Cocker, and his developer too, and yet he *can't* get a picture: certainly on cross-examination it turns out that he filtered it through a tin funnel, and used a filter paper through which his developer had just been passed, but surely these cannot cause any derangement!

Then another, who is "afflicted with an experimental turn of mind"—he has always a new process, but never any pictures; a little longer exposure, and it would have been perfect. "How truly unfortunate!" I hear him exclaim, "here's the finest film of the whole lot has slipped off the plate into the sink during development." Of course, it was the finest; did any one ever know an accident happen to any *but* the finest?

But there are two large classes with whom we can always meet; the first thinks his own pictures, and his own cameras, &c. &c., the very finest that can be; the other thinks *his* pictures, and *his* cameras, &c. &c., the very worst that can be got. "What a lens this is!" exclaims the first, "it really wants no focussing; I can see distinctly the signboard of the 'Cow and Snuffers' through it half-a-mile off; and then there's dry plates—certainly they want twenty minutes' exposure, but that's nothing; I don't prepare them myself, and when I've exposed, I send them to ——, to be developed, and then he sends them to Blackfinger & Co., to be printed. Now, that's what I call pleasant photography; no baths, no developer, no dangerous cyanide, nor anything else, including loss of temper."

But what of No. 2? He is a patient, zealous, enthusiastic worker, and though his results are often very creditable, he looks with a gloomy eye on everything, rarely satisfying himself; to his eye everyone beats him, his lenses are always bad, something or other's wrong; but it never strikes him that he himself may be wrong. Now there is another point that photographers are at issue about, and that is the expense necessary to go to, to obtain good pictures; it is certainly worthy of remark that results are frequently in an inverse ratio to the amount of money spent. During the present summer, being on the Continent for professional purposes, I received an introduction to a wealthy English amateur, residing in a lovely chateau; the house, the gardens, the stables, all bore testimony to the wealth and expenditure of the proprietor, if not to his taste. In reply to my first remark about photography, he exclaimed, "Ah, sir, I've done some wonderful things; already I can produce three primary colours in the same picture, and decided traces of a fourth." My curiosity was raised, the News should soon know all about it. Had he a specimen? Really at the present moment he had not, the discovery was so very recent, and he must perfect it. Would I like to see his glass-room, &c.; of course I would, I came on purpose. Arrived there, I found a large glass-room, cameras, and lenses by every known maker, collodion, bottles, baths, head-rests, tables, chairs, pilasters, backgrounds, &c. &c., enough to stock a large house of business; but I saw no negative except such as I concluded were wasters; my host being called away for a moment, his little son came running to show me the album of photographs, adding archly, "My pa, did every one of them." Horrors! could it be possible that these execrable productions were the work of those splendid lenses and cameras! had the fertile brain that could soar to the altitude of producing four colours in one picture produced these! It had, indeed, and worse; here was a case in which the royal road to photography was taken, and value thereof exhibited in the picture obtained. But now let us look for a moment in another direction.

A fortnight ago I received by post a parcel of very sweet, excellent photographs, about 6 inches by 4, which, a letter informed me, were the work of a shoemaker in a northern town, to whom I gave some instruction three or four years since.

Probably all his apparatus and stock are not worth more than £4 or £5; his only time for working before breakfast, or late at night, but he had studied the works of good photographers, compared them with his own, laboured until he came near the standard aimed at, and, to use his own words, having found a good process stuck to it; and though a careful reader of the writings and works of good photographers, kept steadily on, unless he saw good reason to change his ordinary practice. Now, really, these two men are to be found daily amongst photographers, and the ends obtained by each are well worthy the attention of all of us.

(*To be continued.*)

INSTANTANEOUS PHOTOGRAPHY.

BY L'ABBE' DESPRATS.

The results hitherto obtained in instantaneous photography, however marvellous they may appear at first sight, really present nothing very astonishing. We ought rather, it seems to me, to be astonished at arriving at these results so tardily. We are certainly far from wishing to depreciate the real merit which necessarily attaches to these new productions, but we believe there is nothing in them above the known resources of photography. Let us then briefly examine what these resources are, and perhaps we may discover that if, under the relation to instantancity, these resources seemed to have failed in the hands of most operators, it is owing to their not having availed themselves of them, and employed them simultaneously.

In what conditions, therefore, must we place ourselves in order to be able to operate instantaneously?

Above all things, we must be provided with a good collodion. No other photographic agent can be advantageously substituted for it. But as all photographers well know, there are very quick acting collodions, and also very slow ones. It is remarkable that ether in excess, although it yields a very tenacious collodion, causes it also to lose in sensitiveness. With alcohol in excess, just the contrary is the result. In excess of alcohol, the collodion is perhaps less tenacious, but usually more sensitive. This increase in sensitiveness appears to result naturally from a greater permeability, and consequently there are fewer obstacles to the action of light, and especially to the action of the sensitizing and developing solutions. It is true that collodions prepared with excess of alcohol are more quickly altered by time, particularly if the alcohol is too hydrated, but this is a very slight inconvenience, which will always be very largely compensated for by the importance of the result we have in view.

A second condition, and one of no less importance, is that of having a good light. Is it sufficient for that end to operate simply in the full sunlight? Certainly not. For unquestionably there occur days during the summer months, during which the atmosphere, although perfectly free from clouds, will nevertheless be much less luminous than if clouds occupied a considerable portion of it. Thus, a landscape may be very luminous, especially if to the direct light of the sun it receives, there be added much light reflected from strongly illuminated white clouds. These two conditions do not always present themselves, but as they do occur occasionally, the operator must avail himself of them. But still this is not all. Not only must he seek a good light, but he must also economise it as much as possible: that is, his camera must be fitted with two objectives of large diameter and short focus.

It may be readily understood that diaphragms, however large, cannot be employed in this case, for the loss of light would be considerable, and put an end to instantaneity. But then it may be asked, what will become of sharpness? It will be such as we see in certain instantaneous proofs of commerce, rather imperfect it is true, but still passable. It is only with a first-class objective that we can attain instantaneity, in limiting ourselves to employing known means. It must be clearly understood that in this place we speak only of stereoscopic pictures; the dimensions of which are sufficiently limited to admit of the objective covering the whole area with the desired degree of sharpness.

It is of course understood that the two objectives of the stereoscopic camera must act simultaneously upon the same plate, and have the same focus, obtained by working a single screw. The caps must be made to open and shut without the slightest intermission. This is the business of the optician, and presents no difficulty.

There is a third condition, less important, less decisive perhaps than the first two; but which, nevertheless, must not be neglected. This is the sensitizing bath. All baths are not equally sensitive. Neutral baths, a little old in use, are much better than acid baths. We insert, in the first place, a very pure nitrate of silver, well crystallized in perfect crystals. In this state it is not acid; but it is easily rendered acid by fusion. This fusion must be performed by the operator himself in a porcelain capsule, placed on slightly incandescent charcoal. The operation must not be considered as complete until the salt has become quite fluid, and the black reductions obscure the whole mass. In brief, the action of the fire may be pushed just so far as to obtain a disengagement of red fumes due to deutoxide of nitrogen. The bath prepared with such a nitrate, will sometimes cause a slight general fogging; but as this veil is uniform, it will injure the sharpness of the negative, only the positive will print a little slower, which need not be considered as a serious defect. It has been stated above, that a special bath will greatly promote instantancity; but there is no occasion to repeat in this place what must be well known to all photographers. As may be seen, it is only necessary to make them all concur to the same end. Unfortunately, at the present season, the sun is not very liberal of its beams, and we are thereby deprived of one of the three conditions laid down as essential to success in instantaneous photography; but with the return of summer, we are sure that disciples in this branch of the art, recognizing upon what success depends, will greatly increase, and the number of their admirers also.

GLASS POSITIVES IN GOLD.

Mr. W. J. Miers, writing to our contemporary, the *British Journal*, suggests a method whereby the silver forming the image in a collodion positive may be removed, and gold substituted in its place: the process having especial view to ornamental purposes. He says:—

"The method of proceeding I adopted was this:—Taking a positive or negative with clear lights, the surface was first wetted, and then flushed over with a solution of chloride of gold, of a light sherry colour, several times, until the maximum intensity was obtained; the plate was then thoroughly washed, slightly drained, and then immersed in dilute nitric acid (about acid one, water two parts), or the acid may be poured on, as in developing, for one or two minutes.

"The plate is to be rinsed, then drained for a few seconds, and a strong solution of ammonia poured over it for about half-a-minute; the plate is to be again rinsed and the nitric acid applied, also the ammonia, taking care to rinse between the operations, which, if repeated three or four times, will clear the plate of any visible traces of the silver picture; nor will the picture when viewed by transmitted light, now present any indication that the silver forming the picture at the commencement of operations has been dissolved away—yet in the subsequent stage of the process the lightest shades of the positive are found to be reproduced in another material. The plate is then to be dried carefully and subjected to some operation for reducing the black, precipitated gold to its proper colour."

The steps for reducing the gold to its metallic form Mr. Miers was prevented by other engagements from carrying fully out; but he makes the following suggestions on the subject for the guidance of those who may have opportunity of prosecuting the enquiry:—

"There are many ways of effecting this reduction, as phosphorus in the presence of aqueous vapour, sulphurous acid, &c.; but the readiest was putting the glass in a kind of muffle in a common stove, making it red hot, for a few minutes, and withdrawing it very gradually to prevent the glass from cracking. The necessary apparatus can be readily made by taking a piece of iron, about the thickness of half-a-crown, rather larger than the glass, spreading upon it some whiting about 1-16th or 1-8th of an inch deep, the surface of which is to be pressed quite flat and level with a piece of board or glass. The picture is then to be laid on the whiting, face upwards, another piece of thin iron slightly bent, so as not to touch the face of the picture, is to be placed on the top. This iron is to be rather wider at the side and bent so as to clip the under side of the thicker iron plate, forming a kind of cover open at both ends, through either of which the thicker iron and picture may be inserted or withdrawn. This may be placed on an ordinary fire, if burning clearly, and allowed to get red hot; and if withdrawn gradually and kept from draughts the glass will seldom crack. But in a great many of my experimental plates the glass was merely clipped by a piece of soft iron wire wound round it and held in the hollow space of a clear fire for a few seconds until red hot, not allowing the glass to lose its shape by keeping it too long in the fire.

"The precipitated gold forming the picture will now be found changed in colour from an ugly, dense, slaty, black, to its natural colour, approaching somewhat the well-known appearance of water gilt-work in ormolu; but the colour is not always pleasing, having at times a slight red tinge. As far as I can recollect, however, this depends on the strength of the gold solution, a weaker solution producing more favourable results. But as it is more than three years since I have experimented on the subject I am not quite certain on this point. I have very little doubt in my own mind that if this part of the process were more fully worked out, perhaps, by some of your numerous readers competent to undertake the task, some highly successful results would be obtained—perhaps the opening out of a new branch of practical photography in a useful and advantageous direction."

It is not for portraiture this process is recommended, as golden flesh, &c., would scarcely have a desirable effect. It is obvious, however, that in various branches of ornamental or decorative art, the results might be useful. Mr. Miers adds:—

"It is very easy to combine the two effects of gold and silver on the same surface by gilding first, using two negatives, one for each operation, arranging and blocking out the parts so as to avoid the interference of one process with the other, while with the further and appropriate addition of colour novel and pleasing effects might be produced unattainable by any other means.

"By way of caution I should recommend those who do not meet with success at first to try again, and to make their own chloride of gold, as that obtained at some places, and used for colouring paper positives, may not always suit for this purpose."

A field for ingenious experiment is here suggested, and if the ideas promulgated in Mr. Malone's paper in last week's Photographic News, relative to the production of variety of colour from the various modes of reducing the same metal, be borne in mind, some interesting results may be obtained.

PHOTOGRAPHY.

(*From The Mechanic's Magazine.*)

[In reprinting the following interesting article from our esteemed contemporary, the *Mechanic's Magazine*, we cannot forbear suggesting to our readers the contrast between the dignified and intelligent tone which distinguishes these remarks, and the swaggering sneers of the *Engineer*, recently noticed in our pages.—Editor Photographic News.]

The wondrously rapid development of scientific knowledge, and its practical application to the arts, useful and ornamental, during the first sixty years of the 19th century, go to make that period one of the most noteworthy in the history of the world. Two of the most remarkable instances of the growth and advancement of science, and of its reduction to successful practice are, unquestionably, the steam-engine and the electric telegraph, but photography is assuredly also one of the scientific marvels of the present age. To this latter we now propose to devote a little consideration and space, for "every day soft as it rolls along" reveals, in connection with photography, "some new charm." The Great Seal Office, that *alma mater* of inventors, furnishes the clearest and most satisfactory evidence of the activity of the votaries of the beautiful art, and from that prolific fountain we shall, accordingly, draw our facts for the elucidation of its history.

To the indefatigable and talented Mr. Bennet Woodcroft, the public are indebted for having rendered comparatively easy of accomplishment the task of obtaining information relative to any or all of the branches of art and of science which have taken root in Great Britain, not only during the present, but the *past* century, and even *its* predecessors. Mr. Woodcroft, by his admirable system of indexing and classifying the contents of the Patent Office, has indeed supplied the student and the inquirer with the clues, by aid of which they may thread easily that labyrinth of scientific knowledge, and return laden with such spoils of rich information as will well reward them for their journeyings.

In relation to the art of Photography, the gentleman in question has just rendered especial service to all who take an interest in it, and these may be said to comprise the entire population of the civilized earth. He has published, in the form of a small blue book of 165 pages, an "Abridgment of the Specifications relating to Photography." This work, which now lies before us, contains the pith of the various patents which have been from time to time taken out in regard to the art in question, with the dates and the names of the patentees. The compiler of the "Abridgment" very justly expresses, at the outset, and by way of preface, a hope "that the publication will prevent the disappointment consequent on re-patenting an old invention, and by setting forth what has been already done in this department of applied knowledge, cause inventors to exert their talents only upon discoveries and applications that are new." Undoubtedly this is an important consideration in the arrangement of abridgments of specifications, for the mortification and the expense of securing a patent which, after all, is invalid, have been frequently incurred, and are very great. There is, however, another point in favour of these classified hand-books of patented "discoveries and applications," and that is, the easy means they afford of tracing step by step the onward march of the applied sciences, and gauging, as it were, the amount of progress actually achieved in each department of them.

The definition of "Photography," as given by the compiler of the "Abridgment," is, that it is "the art of copying designs or images, however they may be produced, by the chemical action of light upon surfaces prepared to receive that light," and, perhaps, a more intelligible and comprehensive explanation of the term could scarcely be furnished, even if half a page of matter were devoted to the effort.

It will, of course, not be expected that we shall trace the development of Photography from its dawning to the present time, when it is apparently in the very noontide of its prosperous career. No less than 280 names of persons, English and foreign, who have assisted in developing the art of Photography, are mentioned in the manual, and the particular parts they played are specified with sufficient exactitude to show how much of public acknowledgment is due to each.

It is remarked, by Mr. Woodcroft, "That although the action of light on coloured bodies must have been of every-day occurrence, the philosophers of antiquity did not record the fact, and the chemical action of light upon matter would appear to have escaped their notice. The first definite knowledge of this action appears to have been some observations of the alchemists that 'horn silver' (chloride of silver) was blackened by exposure to light. Although the Middle Ages thus furnished one of the facts upon which the scientific principles of photography depends; the others, viz., the proper application of designs or images to sensitive surfaces, and the permanent fixing of the pictures so obtained, are belonging to the present era."

The chronological list of individuals who have remotely or recently thrown light upon matters related to photography, or who have made discoveries which have since been applied in any way to it, commence with the name of Euclid, 300 b.c., who, in his "Treatise on Optics," proves that he knew that "the pictures of bodies seen by both eyes are formed by the union of two dissimilar pictures formed by each eye." This discovery certainly entitles Euclid, in addition to his mathematical honours, to some fame in connection with our subject; for the stereoscope, that admirable adjunct to photography, is based upon the last named principle.

Prominently among the long list of inventors and others who have in modern times advanced the art of photography, are the names of William Henry Fox Talbot, Antoine Jean Francois Claudet, Richard Beard, John Edward Mayall, Paul Emile Chappuis, and others, whilst the last on the honourable catalogue is that of Arthur James Melhuish.

Probably we have said enough to show the nature of the book of which we speak, and to induce those who desire further knowledge of a chronological or historical character, to obtain it, and seek out that knowledge for themselves. It is needless, too, for us to urge the claims of photography as it stands before the world at present. From the Queen down to the humblest of her subjects, the art has admirers and patrons; and although some of its so-called professors have done their best to degrade it, yet it is likely that it will retain its popularity as long as the sun shines and "images" of the forms and faces of loved ones may be "produced by the chemical action of light upon surfaces prepared to receive them."

Of the innumerable practical uses to which photography has been already put, and of the new triumphs in store for it, much might be written, and much speculation based, but it is unnecessary. Next year there will be a vast stock-taking of the material, artistic, and general progress of the world, and the naves, aisles, and transepts of the Kensington Temple of Science will be rich in the display of objects of beauty and utility; but, perhaps, no part of the Great Exhibition will be regarded with more real interest than that set apart and consecrated to photographic works. In that department, there will, undoubtedly, be found reflexes distinguished by those minute points of resemblance, which only photography can produce, of all the remarkable people and places of the globe on which we live, While, therefore, in the various courts of the Great Exhibition there will be seen specimens of the workmanship of the inhabitants of each country, and specimens, also, of their natural products, to the photographic section the visitor may turn, and gaze on sun pictures, wrought with all possible fidelity, of the features of the various lands from which those specimens and products came.

Who shall gainsay, then, the fact that photography will play a great part in the coming festival of talent. It, indeed, and literally, "holds the mirror up to nature," whilst on that mirror nature indelibly paints her wondrous forms and features.

We are aware that an unseemly question has arisen between the Commissioners of the New Kensington Palace and the principal exponents of the art of Photography, as to the rank and position it shall take in the halls of that place. We certainly see no good reason for excluding Photography from the Fine Arts department, as there is ground for fearing it is the intention of the ruling powers of the International Exhibition to do. The Photographer, in the sense in which we understand the term, is as much entitled to be considered an artist as is the engraver or the painter, and the works he produces are as much works of art as theirs. In saying thus much, we have no wish to disparage the labours of the engraver or the painter; but rather to elevate the labours of the photographer. To form a perfect photograph, a great deal of delicate manipulation is required on the part of the operator, who also must understand completely the effects of light, shade and distance. Chemistry must have been mastered by him, at all events so far as it has any bearing upon the art he practises, if he is to be anything like successful in the practice of the latter. The effects of careful groupings and of colours must also be known to him, and more especially so in Photographic portraiture. In short, it seems to us that a gross injustice will be done to Photographic artists if, in the Exhibition of 1862, photography be not allowed to occupy the position which the voice of public opinion awards to it, namely, that of one of the Fine Arts.

ON THE PRACTICAL APPLICATION OF PHOTOGRAPHY TO THE MICROSCOPE.

BY PROFESSOR O. N. ROOD.*

Collodion.—This article when furnished by makers of repute can of course be used, though it is better for more than one reason to be independent of the dealers if possible. A considerable number of samples of pyroxyline were prepared according to different receipts, and sensitized variously. The very simple process described by Waldack, on page 266 of his *Treatise on Photography*, was found, with slight modifications, to yield an excellent article. The strength of the sulphuric acid was slightly greater than recommended by him; no water was added; the temperature also was slightly higher at the time of the immersion of the cotton. A more prolonged washing than that described in this work is desirable. This collodion can be sensitized with advantage by the iodide and bromide of cadmium, in proportion of four to one. A receipt published in *Humphrey's Photographic Journal* has lately been used by me with very good results.

No. 1.		No. 2.	
Plain collodion,	1 oz.	Plain collodion,	1 oz.
Iodide of ammonium,	5 grs.	Iodide of potassium,	5 grs.
Bromide of potassium,	3 grs.	Bromide of ammonium,	5 grs.

Dissolve the iodide of ammonium and bromide of ammonium in alcohol, the iodide of potassium and bromide of potassium in the least possible quantity of water, before adding them to the plain collodion. Mix Nos. 1 and 2 in equal parts for use.

This collodion, when used according to the wet process, though not very intense when first made, is quite sensitive, negatives of landscapes being obtained in $\frac{1}{4}$ of a second, indicating by their strength that a shorter time would suffice. It acquires intensity by keeping. The exposure is effected by the flap at F, and will last from $\frac{1}{2}$ of a second to four minutes according to circumstances. The development is as usual, hyposulphite of soda being used as a fixing agent. The use of the bromide of arsenic, mentioned in the same journal, gave with some samples of collodion excellent results so far as intensity was concerned.

The negatives thus obtained are examined by a lens of one inch focal length, to test their degree of sharpness. This quality will not only vary with the manipulation, but with the nature of the object: the sharpest negatives obtained by me, when examined by a power of 40 diameters, appear as well defined as finely executed lithographs seen by the naked eye, while other classes of objects (dots in pine wood, &c.), with all care, yield negatives which present the same appearance under a much lower magnifying power.

Positive Prints.—In order to preserve the fine details, the prints should be taken on glass, not on paper; mica answers when a print is to be transmitted by mail. Great care should be used that little or none of the fine markings on the negative are lost in this process; a bright light (sunlight thrown on the negative backed by ground-glass), a small diaphragm before the copying lens, and careful allowance for the chemical focus, are the essentials. To produce enlarged positive prints on glass, the negative is placed on the stage of the microscope, and treated like a microscopic object, the magnifying power varying from 5 to 20 diameters. If the prints are to be on *paper*, it will be found that a more liberal use of nitrate of silver and chloride of gold than is generally recommended, makes success easy.

Magnifying Powers employed.—To produce enlarged images, the objectives, as is well known, may be used alone or in connection with an eye-piece. In the former case, with proper illumination, sharp images are produced when the distance between the object (on the stage) and the ground-glass is as great as five feet. With this distance the

1 inch enlarges 65 diameters.
$\frac{1}{3}$ " " 190 "
$\frac{1}{7}$ " " 450 "

In using the objects in this way the screw collar is set *after* the microscope is connected with the camera.

For more highly enlarged images it is best to add the long eye-piece as has been practised by some experimenters. The adjustment of the screw collar can then be very nearly

* Continued from page 531.

completed before the microscope is connected with the camera, which is a great saving of time: it will, of course, fall nearer the mark "uncovered" than in the first case. However perfectly this operation may be performed in either instance, allowance must still be made for the actinic focus. By varying the distance between the eye-piece and the ground-glass, different degrees of enlargement are obtained. When the long, or two-inch eye-piece is used, the distance from the object-slide to the eye *lens* being 12 inches, from the latter to the ground-glass 34 inches, then

1 inch	enlarges	160	diameters.
$\frac{1}{3}$	,,	550	,,
$\frac{1}{7}$	,,	1300	,,

Powers obtained in this way with the two latter objectives have been used by me with advantage.

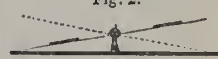
Thus with the 1-7th 113° aperture, the Wollaston doublet of 44° aperture, having a central stop, being used as a condenser, I obtained sharp negatives of the *P. angulatum* magnified 1300 diameters, with well defined hexagonal markings similar to those obtained by Wenham with a 1-12th of 130° aperture. Portions of the negative bore a photographic enlargement of 10 diameters. Mr. Wenham announces* that he has discovered, by the use of a 1-30th of large aperture, made by himself, that the markings on this object and on some others, are really due to spherical particles of quartz, which can be made by illumination to appear hexagonal. With a power too low, I obtained photographs of the *P. Balticum* with *hexagonal* markings; with a higher power and a larger angle of aperture, the tendency was to the spherical form.

Photographs by Polarised Light.—A Nicol's prism is placed under the stage, one also directly behind the objective, sunlight is reflected from the mirror, and one of the prisms revolved till the field is dark; with the low powers, by this simple arrangement, photographs of objects may be obtained which exhibit the structure revealed by the polarised light. For higher powers it is necessary to use the polarising arrangement described by Von Mohl, *Pogg*, vol. ciii. p. 178, and recommended by Carpenter; that is, the light from a large Nicol's prism is concentrated on the object by an achromatic condenser. The perfection with which this apparatus operates may be inferred, when I state that photographs of the cross and rings in starch granules, as well as of the *P. angulatum*, in a dark field, were obtained by me without difficulty. Von Mohl remarks that with inferior apparatus some very distinguished observers have been unable even to *see* these appearances. The selenite stage can of course be used when it is found desirable.

By arranging the apparatus according to the plan adopted by Prof. v. Kobell in his micro-stauroscope (this Journal [2], vol. xix. p. 425), the peculiar effects which microscopic crystals produce on the cross and rings of calc spar can be photographed. By removing the condenser and objective, as well as the slide containing the crystals, beautiful photographs can be obtained of the normal cross and rings; the systems of rings in other crystals can be photographed by substituting them in place of the calc spar, as well as the changes which they undergo by combination with plates of doubly refracting circumstances (circular analysis, &c.), it being merely necessary to introduce the plates or films at the proper positions. I was shown by Prof. Dove some years ago, while in Berlin, photographs of the normal cross and rings around the axis of the calc spar; but, so far as I know, this is the first attempt to photograph the changes which the cross and rings undergo by the action of microscopic crystals.

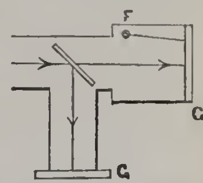
Stereoscopic Photographs of microscopic objects can be obtained with the monocular microscope, by covering first the right-half of the objective, then the left by a suitable brass cap, and taking two successive pictures. When using this method it becomes necessary to move the mirror towards the right or left hand with each successive exposure, which is not only inconvenient, but often produces a slight distortion that prevents the proper stereoscopic union of the two photographs. On this account I have generally adopted a different plan. The object is placed on an extra stage, which can be inclined from 5° to 10° as seen in profile in the woodcut, *fig.* 2: it is photographed first at one angle then at the other. In practice the manipulation is easy, and no particular difficulty is experienced from the fact that the extreme right and left hand portions of the field are thrown slightly out of focus. High and low powers can be used equally well. The second negative should be taken immediately after the first, before the illumination has altered. I do not know that stereographs of microscopic objects have actually been taken by other experimenters, though this may easily be the case.

Fig. 2.



Living Organisms offer the photographer some difficulties by their constant motion about the field, and in and out of the focus. It becomes necessary to adopt a plan by which the image can be thrown on the sensitive plate the very instant after the animalcule has been brought into focus. The following method has been used by me with success to obviate this particular difficulty:—A plate of glass with parallel sides is introduced at an angle of 45° into the tube outside of the camera: it reflects an image of the object to the ground-glass at G, *fig.* 3, which is placed so that an equally sharp image of the same object is formed at G′. The sensitive plate is introduced at G′, the flap at F being closed: with one hand the operator, by the aid of the image at G, focusses on the animalcule; just as this is effected, the plate is exposed by the other hand turning the flap. If the collodion be sensitive, a second, or less, suffices to give an image; if a longer exposure be desired, the image of the animalcule on the ground-glass at G can be watched, and the exposure prolonged till the creature begins to change its position. The real difficulty in the case of living organisms is found in the fact that all parts of them do not lie in the same focus. This in fact is one of the most important difficulties connected with the whole subject of microscopic photography; but the introduction of a slight modification in the ordinary *compressorium* removes it in many cases. The plate of glass on which the objects rest, instead of being plane, is made slightly *convex*, by the use of a spectacle lens of rather long focus. Objects to be examined are placed near the point of contact, and pressure applied as usual, when they are brought nearly into the same plane.

Fig. 3.



* *Quart. Journal of Mic. Science*, No. xxxi. p. 145.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 13th November, 1861.

It is pleasant and gratifying to the earnest photographer to watch the upward growth of his favourite art, and trace its geographical process. It is not long ago since I announced the formation of a Photographic Society at Marseilles, which may be regarded as the second capital of France. So popular has the art of photography become, that already this Society numbers its 700 members, and has lately organized an exhibition, with the distribution of prizes, which has been most numerously attended. The secretary, M. Louis Vidal, had the tact to deliver three lectures on popular branches of the art, exhibiting the processes of carbon printing, of photo-lithography, of heliographic engraving, of heliochromy, of enlarging negatives and positives, and to describe the various apparatus employed in photography. These lectures were remarkably well attended, ladies forming a large portion of the audience, and there can be no doubt that the zeal and intelligence of the secretary will have the effect of popularizing photography among the people of our Southern Capital. I think some of your societies, which address themselves so exclusively to the practical photographer, professional or amateur, would do well to follow the example set by M. Vidal, and address themselves familiarly to the general public, a large accession of members and consequent increased power and usefulness would doubtless result.

M. Reynaud has invented an economical gunpowder applicable for mining purposes, to which he gives the name of *pyronome*. It consists of—

Nitrate of soda	52·5
Spent bark (tan)	27·5
Sulphur in powder	20·0
	100·0

Its preparation requires the following operations:—

1st. To dissolve the nitrate of soda in a sufficient quantity of water.

2nd. To mix the tan in this so that it becomes thoroughly impregnated with it.

3rd. To mix the sulphur in the same manner.

4th. To withdraw the product from the fire, and dry it.

5th. To complete the drying, and pack the compound in sacks or barrels.

Moistened and dried anew, the *pyronome* has not lost its explosive qualities, and may be employed as when first prepared. This valuable quality renders it superior to ordinary mining powder.

The Emperor Louis Napoleon, in recognition of the value of their discoveries in spectrum analysis, has given to Professor Bunsen the decoration of an officer, and to M. Kirchoff the cross of the Legion of Honour. M. Dumas wrote a very interesting communication to the *Moniteur* apropos of this acknowledgment of the learned Germans' services to science.

VARNISHES FOR NEGATIVES.

Dear Sir,—I generally make my own negative and positive varnish, but the other day being out of stock, was induced to use some of Gaudin's French varnish, and the consequence was that a portion of the collodion film was shifted and nearly floated off into the bottle. As an experiment, I added to the bottle of varnish ten drops of distilled water, shook it up and let it stand all night, tried it on a plate next day, and have used it since in perfect safety, with not the slightest symptom of the film shifting. Perhaps the above hint may be useful to others, as it has been to me.

To those who make their own varnish, the following method of bleaching shellac may be of service:—

White shellac.—Take two or three ounces of orange shellac, put it into a large evaporating dish, and melt it slowly over a clear fire; when melted pour it on a stone slab, or a piece of slate, let it set a little, then draw it out quickly, and throw it over an iron hook, double it up and throw it again and again, several times, till it loses its colour, or begins to set, and in that case warm it over again before the fire. It may be done by drawing out with the hands only, and doubling it up quickly, but throwing it over a hook or large iron nail is most effectual.—Yours truly, Thomas Gulliver.

Heathfield Street, Swansea.

[Shellac is unquestionably the best basis for a negative varnish. We have never recommended photographers to make their own varnishes, as the process is troublesome, and the result not always efficient. We regret to add, however, that we have received many and varied complaints recently of commercial photographic varnishes. Possibly in some cases the evils complained of may be overcome by the exercise of a little judgment and ingenuity, such as our correspondent describes in the first part of his letter. One correspondent recently describes the loss of some negatives through using Rigge's varnish, which stuck to the paper, and destroyed the film. It is always wise in using a new sample of varnish, to test it first, and learn to humour its peculiarities before risking its use on good negatives.—Ed.]

THE NATURE OF THE PHOTOGRAPHIC IMAGE.

Sir,—I have read with much pleasure the report which appeared in your journal last week of Mr. Malone's discourse at the London Photographic Society. In referring to the chemical nature of the photographic image, the lecturer had selected a topic particularly interesting to me, from the circumstance that it is one upon which I have been experimentally engaged; and it affords me much satisfaction to observe the close conformity between the views now advocated by Mr. Malone with those published by myself in the *Philosophical Magazine* for March, 1860. The analogy between the coloured products on our chloride of silver paper, and the red and purple gold of Professor Faraday, appeared to me to warrant the comparison mentioned in my paper; and with respect to the action of light upon chloride of silver, I am convinced that the state of aggregation of the particles of reduced metallic silver, and similar physical considerations, are competent to afford a correct scientific explanation of the wide differences in colour observed in these and other products chemically identical.

Having myself encouraged the hope that it would be possible to solve the question analytically, I took steps to prepare a sufficient quantity of a material which at the time was thought to represent the ultimate product of the action of light. For this purpose, solutions of rock salt and nitrate of silver, excessively dilute, were mixed and exposed all day to the scorching influence of a midsummer sun; the salt being employed in the proportion of less than a grain and a half dissolved in one gallon of distilled water. An opalescent liquid, without visible particles of white chloride. was the condition in which the substance was presented to the decomposing action of the sun's rays, and what was the result? The product had such a chemical composition—silver 82; chlorine 18 per cent. That it might be assumed that one-third of the total amount of white chloride submitted to its action was reduced to metal, the remaining two-thirds being so well incrusted and protected as to escape decomposition.

If this experiment were repeated under circumstances of even greater dilution, the product would contain a larger proportion of silver in admixture with the unaltered chloride; but until we have succeeded in passing the limit prescribed by the composition of the assumed subchloride, Ag_2Cl, the analytical determination will not be considered as furnishing any data for the correct interpretation of the chemical change.

By diligently collecting the products obtained from forty-six gallons of these excessively dilute solutions, I was placed in the possession of a sufficient quantity of "blackened chloride" to enable me to study its reactions, and perform the experiments described in the account referred to. Without proceeding to the enumeration of these, it may be sufficient to mention, that the weight of chemical evidence appeared to justify the conclusion, that metallic silver, and not the hypothetical subchloride, was the invariable product of the action of light upon white chloride of silver; and that certain physical difficulties operated in determining the partial nature of the reduction under ordinary circumstances. It remains, finally, to be mentioned, that these results do not entertain the question of modifications possibly introduced by the presence of organic matter.

From this statement it will be seen how truly corroborative of my experiments were the remarks lately made by Mr. Malone, in reference to the nature of the action of light upon our common photographic surfaces.

I am, sir, yours obediently,

John Spiller.

Chemical Department, Royal Arsenal, Woolwich, Nov. 12th, 1861.

COMMON WATER FOR THE SILVER BATH.

Dear Sir,—Your correspondent E. F. G. is really very considerate in writing to you so promptly, after his "first and last trial," to save others being "misled" by using my method of preventing the printing-bath discolouring. I have to thank you for stating in the foot-note, that you know the process succeeds in my hands; I also know it, but I should not expect it to succeed if I added acetic acid to the bath. Has E. F. G. any idea why *he* adds it? I imagine not; this is just a case in illustration of a very serious evil amongst photographers, where persons making a single crude experiment, and of course failing in the expected results, at once rush into print. Allow me to inform E. F. G. that I never use kaolin, and never filter my bath, and it is invariably clear as a glass of spring water. I will once more describe it, and trust that others will find it the boon I do, and thus save 15 or 20 per cent. of silver.

I dissolve the silver, 70 or 80 grains to the ounce, in water drawn from a tap of the ordinary London water supply, which produces a dense white cloud of carbonate of silver, and probably other insoluble salts of silver. In a few hours this has settled down, and carried with it any floating matters the water may contain in suspension; I do not filter it out into the dish, for the simple reason that there is nothing to be extracted. When done with, I pour it back, and shake up the bottle; once again the carbonic sediment pervades the fluid, and then as before clears down all colouring matter, and floating particles. I have used this commercially, for at least two years, and strongly recommend it.

Samuel Fry.

West Kent Park, Nov. 11, 1861.

[We scarcely agree with Mr. Fry that it is an evil for photographers to state the result of their experience. Experiments should always be conducted carefully; but it is only by the interchange of experience that progress is made.—Ed.]

ROYAL REWARDS TO PHOTOGRAPHERS.

Humphrey's Journal says:—"We notice that Messrs. Gurney, of Broadway, have received by a late steamer a full acknowledgment of their attention to His Royal Highness the Prince of Wales. It seems that they sent to the Prince an elegant photographic album containing portraits of himself and suite. The acknowledgment comes in the shape of a large gold medal, with the Prince's head on one side, surrounded by the words, 'Albert Edward, Prince of Wales,' and his crest, the plume, and motto, on the other. Around the edge of the medal, which is about three-eighths of an inch thick, are the words, 'Presented to Messrs. Gurney and Son, Photographers, New York, 1860.' Accompanying the medal are letters of thanks from Major-General Bruce, on behalf of the Prince. Messrs. Gurney have received similar letters from the Duke of Newcastle, on behalf of the Queen, and from the other members of the Prince's suite, acknowledging the elegant portraits he has sent them.

"The following is a copy of the letter received in acknowment of the portraits sent to the Queen:—

"*Downing Street, London, Feb.* 26, 1861.

"Gentlemen,—The Queen has received the album and oil portrait of the Prince of Wales.

"I am commanded by Her Majesty to convey to you her thanks for these beautiful specimens of American art, and to assure you of her appreciation of the skill with which they are executed, and of the feeling which prompted you to send so interesting a *souvenir* of the visit of His Royal Highness to New York.—I am, gentlemen, your obedient servant, Newcastle.

"*Messrs. Gurney and Son.*

"Prince Alfred is now in Canada, and will be in New York shortly; then there will be a chance for more albums and more medals. Who is to be the happy man? We think it is Fredricks' turn now, as he has got the handsomest gallery."

Photographic Notes and Queries.

Discolouring of the Silver Bath.

Sir,—I noticed in last Friday's News a letter from D. H. F., which induces me to send you the following.

I make my printing bath with distilled water having 80 grs. of nitrate of silver to the ounce, but a small proportion of the positive collodion bath (after adding nitrate of silver to the required strength) had been mixed with it. I have always used kaolin for decolorizing till about last March, when working with a different sample of Rive paper I found my bath did not discolour. The next sample—obtained from another house—made the bath discolour, I then purchased some more of the Rive paper above-mentioned, since which time my bath has never discoloured. There is a small amount of black sediment, which of course is disturbed in pouring back into the bottle, but in a few hours, it is again clear and ready for use. I never filter it. I obtain my paper from Mander, of Birmingham.—I am, sir, yours respectfully, J. W. Fall.

White Fire for the Photogen.

Sir,—Seeing in your "Answers to Correspondents" of last week, one to N. X. concerning "white fire," allow me to mention one that is very bright indeed. It is

Nitrate of potassa	... 4 parts
Sulphuret of antimony	... 2 ,,
Sulphur	... 1 ,,

Powder and mix well.

I remain, your obedient servant, J. L. Davies.

Clapton.

Sir,—Seeing in last weeks News that your correspondent N. X. wishes for information respecting the composition of Moule's Photogenic Light. I beg to inform him that in Dr. Muspratt's chemistry, it is stated to be composed of

Pure saltpetre (nitrate of potassa)	... 112 parts
Flowers of sulphur	... 42 ,,
Black antimony, (sulphide) ...	... 12 ,,

Yours respectfully, W. Burnell.

Splitting of the Film.

Dear Sir,—I should feel greatly obliged if you could suggest a remedy for the splitting up of the film of a dry plate. I use Thomas Hardwick's, and Ponting's collodions, sensitize in a 35-grain bath, wash in distilled water, place in bath of albumen, (1 egg, 10 ounces water, 40 drops ammonia), drain and well wash, dry, &c.

I expose, develop with pyro, only 2 grains, strengthen with pyro, acetic and silver, get a very good picture. Fix in hypo, and on drying, in four cases out of six, the film splits up in fifty pieces, and leaves the glass. You will see I have used three good collodions, separately, hoping to get rid of the difficulty, but without success. Can it be in the bath? for even with wet plates it frequently serves me the same.

Yesterday I dried a plate before fixing, to see if it was the hypo, but before it got dry all over, I heard a *crack*, and in ten seconds the film was in twenty pieces, one of the best negatives I ever took; I clean the glass well, and let the film well set. I have dried by heat, and also spontaneously.

If you can assist, you will greatly oblige, yours obediently,

A Perplexed Amateur.

[Our correspondent appears to take all the precautions which ought to secure immunity from splitting of the film. We have occasionally had it on using alkaline hypo, or on using cyanide; but not often. Thorough cleaning of the plates, and thorough drying before use, are the only remedies we can recommend, changing the collodion, or coating first with gelatine, might also be used. Can any of our correspondents help a "Perplexed Amateur?"—Ed.]

The Nascent State.—The word nascent is from the Latin word, *nascens*, and signifies being born. When water is decomposed, the two gases, oxygen and hydrogen, as they are being evolved, are said to be in the nascent state. In this state they are more ready to unite with other substances than they are after they have remained awhile separate. The same is true of other elements; just as they are in the act of being decomposed, they are more ready to form new combinations. This property is rendered available in chemical manipulations; combinations are formed by presenting the elements to each other in the nascent state, which it would be impossible otherwise to effect.

Talk in the Studio.

Photography at King's College.—We have pleasure in announcing that Mr. George Dawson, M.A., has been appointed lecturer on photogrpahy at King's College, in place of Mr. Sutton, resigned. Our readers are familiar with Mr. Dawson's papers, read at the North London Society, and published in our columns. The college has secured in him an accomplished scholar, a sound chemist, and a first rate practical photographer. As he has been engaged before in the work of tuition, he is well fitted for the task he has undertaken. We can congratulate the North London Society on the circumstance, securing them the continued presence of a member whose premeditated residence in the country would have been to them a great loss.

Photographs of Volunteers.—We had recently an opportunity of inspecting a very elegant album, which, filled with portraits of members of the London Rifle Brigade, was presented to the Lady Mayoress by Mr. D. Combe, of Cheapside, a sergeant in the corps. The album was bound in green velvet, ornamented with gold. The portraits were of those members to whom colours, bugles, and other prizes were presented on the 19th of October at the Crystal Palace. The portraits were taken by Mr. Combe, and many of them possessed much excellence. Lady Olliffe expressed herself much gratified with the present, as a gratifying *souvenir* of an occasion she would always remember with interest and pleasure.

The Small Suburban Society.—A provincial member writes:—"When is the next meeting of the South London Society? I am coming to London, and should much like to be present to express my feelings in favour of the Memorial. I think we are the most plucky of all the societies, although such a 'very small suburban,' &c. &c. &c."

Episcopal Photography.—*Punch* says: "Dr. Thompson, the new Bishop of Gloucester, is stated to be an expert photographer. Lord Shaftesbury begs us to add that his last creation is also an ecclesiastic of the decided school, and, in fact, that all his views are positives!"

Photography in the Exhibition at Florence.—The Italian correspondent of the *Daily Telegraph*, whose description of, and criticisms on, the Florentine Art Exhibition, are well worth reading, makes the following remarks on the photographic department. We shall be glad if a similar verdict be recorded at South Kensington, next year:—"The photographic gallery now consists of millions. There are portraits of all sizes and shapes—landscapes, architecture, and sculpture. I really think the best pictures are from the hands of a gentleman, whose English name and title—"Warren Vernon, 'amateur'"—attracted my attention. Some of his landscapes are beautiful. The medals for this branch of art are not yet allotted.

Child Poisoned in a Photographic Van.—On Friday evening an inquest was held by Mr. C. C. Lewis, at the Red Cow, Chapel-street, Stratford, on the body of Henry Giblett, aged two years and six months. It appeared that the deceased accompanied some other persons into a photographic van in Bridge-road, Stratford, and as they were having their portraits taken he suddenly became alarmingly ill, and by the time Mr. Kennedy, the surgeon, arrived, had expired from the effects of a quantity of iodide of potassium, which it is supposed he swallowed out of a phial which was in a cupboard. The jury found an open verdict, that the child died from the effects of the poison, but how administered there was no evidence to show. *Morning Chronicle.*—[Cyanide of potassium is most probably meant, although the iodide is a poison.—Ed.]

Bromides in Dry Collodion.—The following extract from a letter just received from a correspondent who had had some trouble in getting good results from dry plates, will interest some of our readers. "By following your advice kindly given me of adding half a grain of bromide to the ounce of collodion, "Ponting's," I am enabled to work the Fothergill process with almost certainty. I have just returned home after exposing two dozen plates stereo, some exposed a week after preparing, and developed a month after exposure; others at times to exposing a month after preparing, and develop a week after exposure. all good ones."

To Correspondents.

Membership in London Photographic Societies.—We have had several enquiries recently as to the mode of becoming members of the London Photographic Societies. It is necessary to be proposed by a member, and the election is by ballot. The subscription to the parent society is a guinea a year, and a guinea entrance fee. To the North London and South London Societies the annual subscription is half a guinea.

A Subscriber from the Beginning.—The definition of the picture enclosed appears pretty good, but it is straining the lens slightly to use it for card portraits, and you are too near the sitter when you use a lens of such short focus. The proportion of background, &c., has a great effect in influencing the appearance of shortness or tallness; a standing figure alone without accessories of any kind to give the suggestion of relative size, generally looks too tall. This effect is materially enhanced, if there be as much space underneath the feet as above the head. It is a difficult thing to lay down absolute rules for such cases; but the following may be taken as an approximate guide: the length of a card picture is from 2⅝ inches, to 3⅜ inches; a standing figure of about 5 feet 6 inches in height, will appear in fair proportions if it be from 2⅜ inches to 2¾ inches, being about a quarter of an inch beneath the feet, and three-quarters of an inch above the head. Your figure is much too large, in proportions, for a card portrait. You state that the lady is short, and yet you have the figure upwards of 3 inches high. It should probably be about 2½ inches high. 2 The camera for a standing figure should be placed opposite the chest, and quite parallel to the figure; for a sitting figure it may be opposite the head and tilted a little.

J. S.—Your card picture is in many respects, for an amateur, a very good one indeed. To neutralise your toning bath, make a solution of carbonate of soda, and add a drop at a time, testing between each addition with blue litmus paper, until it ceases to turn the test paper red.

Tyro.—The fault is not in the paper. It is manifestly imperfect fixation. Where the process appears to have been conducted so perfectly *en règle*, it is very difficult to fix upon the point of error. The hypo solution has been too weak, too many prints have been fixed in it, they have stuck together, or the hypo has been a bad adulterated sample; but which of these causes we cannot say. Possibly the toning solution has been acid, and there has been some decomposition of the hypo. The November meeting of the South London Society was held last night.

Hope.—Send us your address, so that we may communicate with you direct.

Ignis Fatuus.—The material for burning in Moule's Photogen is sold ready prepared. 2. We do not remember the price; about 8d. per lb., we believe. 3. Wherever it is used, there must be a flue to conduct the products of combustion carefully into the open air. 4. Some use of screens is important to a proper control of the light. 5. It would be dangerous, if improperly used.

Wm. Barnett.—A bromo-iodized negative collodion is best suited for iron development. There are several good ones in the market; but as we generally make our own, we are not in a position to recommend any especial maker. We have heard that of Burfield and Rouch, and also that of Mr. Hughes, highly spoken of.

F. L G.—A weak iron developer acts more slowly, and gives more density. A strong one acts more rapidly, but does not give so much intensity. Shorter exposure may be given where a strong developer is used. We prefer the iron solution made a little time before use. Never add silver to the iron developer. Acetic acid is better than citric with iron.

Ram Chunder Rao Bulvunt.—We have replied in the Photographic News all the letters we have received from you; but it is impossible to answer all your queries at length, as some of them would require complete treatises. Procure, if you can, "Hardwich's Manual of Photographic Chemistry," and some of the shilling instruction books. If you can, get Mr. Hughes's recently published "Principles and Practice of Photography." You can get the "Photographic Teacher" of Messrs. Le Page in India, as we know they keep it. Their London house knows nothing of any order or payment for the "Photographic Almanac." You had better get the agents in India to order a copy for 1861 and one for 1862 specifically, and they will doubtless be sent to you. In taking portraits in the open air, secure a position near a house or a wall, to obtain some shadow. 2.—We can only give you general hints for a glass room here. Let it be about 30-ft. long, 15-ft. wide, and 12-ft. high. 20-ft. of the roof glass, 10-ft. for the part above the sitter, dark. If convenient, all the sides glass, and plenty of blinds and screens to shut off light from any part where shadow is wanted. 3. Your collodion is probably too old. Make some fresh, and add to it. The formula you name is very good. 4. For landscapes you can either use a tent or dry plates. Collodio-albumen plates would suit you best. 5. Your prints are a little under-printed, but they indicate that the negatives are under-exposed and over-developed. They are also lighted too directly from the front. 6. The holes which occur in the negatives in the process of printing, seem to indicate that the varnish is not hard enough, and that more care must be used. 7. Add more acetic acid to your developer, and use it weaker. The Rev. J. Lawson Sisson's dry process was published in our pages some months ago. The only available method of taking portraits by artificial light that we know of is by the aid of Moule's Photogen.

Amateur.—The blue-tinted glass is, we believe, rather expensive, but we do not know the price. It shuts out some light, and is not of much service. The white sheet-glass is best so far as lighting is concerned, but it is apt to "sweat," and become dull. We should use a common sheet of glass of as good a colour as possible, consult a respectable glazier, and tell him your especial requirements. Both negative and printing in your reproduction appear very good.

An Enquirer.—The term "a German lens" is too indefinite to enable us to offer an opinion upon it. We have seen some of Jamin's lenses which were good. If you approach too close to the figure with a lens of short focus, you will get an unnatural effect. Your negative has been much under-exposed. The stains have probably been caused by allowing the developer to run into streaks, causing increased development.

R. G.—We can only advise you to repeat your application to the secretary. We were not aware that the exhibition was closed, as we have been looking out for some intimation of the award of prizes; but have not received any answer to enquiries ourselves, nor have we seen any intimation in the Society's organ. We believe the secretary has been much pressed with his private duties lately, and the position in the society is honorary.

Several other Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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ON MOUNTING PHOTOGRAPHS.

BY G. WHARTON SIMPSON.*

There are few things which contribute more to the general perfection of result in a picture than the mode in which it is mounted; and, as most photographers know, much of the permanency depends upon the adhesive material used in mounting. As but comparatively little attention has been given to this subject, I propose very briefly to devote a few words to the general question.

The first point to be considered will necessarily be that of trimming and shaping the print preparatory to mounting. In deciding the shape to which a print should be cut, whether rectangular or circular, oval, cushion, or dome, three considerations will weigh: first as to how much of the print makes a good composition; second, as to whether the corners, &c., are perfect, and third, the general contour and character of the lives in the picture. No specific directions can be given regarding the first point; nothing but good taste and a knowledge of the laws of composition can guide the photographer in determining how the picture will gain by the retention or exclusion of an inch, more or less, of the subject in his negative. His technical taste will, however, readily guide him to the rejection of dark or ill-defined corners, unless indeed they aid the composition in some degree. I remember some one exclaiming, when examining some of Wilson's instantaneous sea pieces, recently exhibited as single pictures about $4\frac{1}{2}$ by $3\frac{1}{2}$, in each one of which the dark corner produced by loss of illumination and definition at the edge of the lens was present, "What a pity Wilson did not vignette these prints, or cut them oval or circular, so as to get rid of these dark corners!" "That," replied another gentleman, who knew Wilson, "would have entirely frustrated the intention in leaving them, which is to force the lights, and by contrast give brilliancy to the prints, as they are from very thin negatives." This is an expedient, however, which should rarely be used, and then sparingly. But it illustrates that there are occasions when power may be added to the composition from the retention of a dark corner imperfectly illuminated or ill-defined.

The best shape for the print will often be governed by the prevailing lines in the picture, and especially by the general character of the outline. Where a number of parallel lines, vertical or horizontal, prevail in the subject, an oval or circular shape will often materially help the picture, and prevent the formation of angles, which must become striking if the rectangular shape be adopted. On the other hand when the principal lines fall in curves, the rectangular shape will be most suitable. In no case, however, is a perfect square desirable. The oblong form should in all cases be chosen: whether the greatest length should be vertical or horizontal, will be governed entirely by the subject.

It is never desirable in shaping the print, to follow the outline, or principal lines of the picture. If the picture be vignetted, it will rarely look well cut to an oval, circle, or dome; the corners should in almost all such cases be left square. The object should be to secure harmonious variety, and by the shape of the print to give the utmost value to graceful lines, or to distract attention from awkward forms. Another purpose may be sometimes gained by the shape of the print. It sometimes happens, especially in architectural subjects, that in obtaining a view of certain objects, it is immediately surrounded by others of less interest, which cannot be entirely removed without spoiling the picture. Where vignetting cannot be, or has not been, used to partially ignore these intruding elements, then the circular or oval form may be adopted with advantage, which by cutting away portions of the objects not required, at once gives importance to the principal figure left alone in its integrity. These, of course, are but general hints, not absolute rules. I may here remark that except where the exigencies of the photograph imperatively demand it, on account of dark corners, &c., I think that the shape styled by photographers the "cushion" shape, should generally be avoided as meaningless and inelegant. In most cases where it is used, the perfect rectangular shape would be much better. Where the corners are rounded, however, care should be taken to avoid a sweep which leaves it uncertain whether it is a flattened circle, an imperfect oval, or a cushion.

I may here add also one word more on the cutting out of card pictures. These are, of course, always best left rectangular. But it is an important point to remember that the due proportions of stature are chiefly indicated by the amount of space at the top and bottom of the figure. The size of the picture is generally from three inches and five-eighths to three inches and three quarters long. As a general principle, the amount of background above the head should be from half-an-inch to three-quarters of an inch, and the space below the feet, not more than a quarter of an inch. The exact amount will vary, of course, with the stature of the figure, but these remarks apply to a middle height. I may add also that it is a good thing to adopt a standard scale of proportion in taking such portraits, in order to give the pictures the value of suggesting truth in this respect. About half-an-inch for each foot in height would be found a good approximate scale for standing figures.

The best mode of shaping is to proceed as follows: If the prints have been rolled up, and are, therefore, inclined to curl, roll them the reverse way on to a roller and leave them for a few minutes, at the end of which time they will lie straight. A thick piece of plate-glass cut to the required size and shape is the best guide, as it enables the manipulator to see exactly the position and amount of picture included. I may here describe a very good contrivance described to me a day or two ago by Mr. Samuel Fry, which he had made for cutting out the card portraits. It consists of a plate of copper with an aperture the size and shape of the photograph. At each corner of the aperture there is a slight slit, proceeding, both vertically and horizontally, a little into the copper, so that in cutting, the knife passing into the slit, cuts the corner of the print clean, which it would be somewhat difficult to do if the knife could only just pass up to the corner. A sharp knife or old razor may be used to cut with; and a piece of glass, or a piece of smoothly planed lime-tree, to cut upon. The latter is most valuable, as it does not so readily dull the edge of the knife; and unlike other woods, its grain and texture are sufficiently homogeneous to allow the knife to pass without the vibration which gives a ragged edge. The utmost neatness and skill in getting a clean cut edge, free from jaggedness is imperative.

The proportion of margin is another subject on which the educated will be the best general guide; but upon which a few hints may be useful. Few things contribute more to give value to a print than a respectable margin; it is nevertheless by no means an uncommon thing to see very

* Read at a meeting of the South London Photographic Society, on Thursday, November 14, 1861.

fine pictures spoiled by shabby mounting. Nothing would be more difficult than to lay down any absolute rule on such a subject; but a very fair approximation to a rule may be obtained by deciding that the margin on the sides should never be less than one-third of the breadth of the print, and on the ends, not less than one-third the length. With small prints a margin of not less than two-thirds of the length and breadth is desirable for the best effect.

Under some circumstances the proportion of half the breadth for the side margins, and half the length for the ends will give a good result. But I have heard this principle objected to by persons of taste, as tending to formality and stiffness; it being urged that all proportions consisting of parts of even numbers tend to that formality. I have heard some attempt to establish a principle based on the analogies of musical science; but I fear that it would be difficult and unsafe to lay down definite rules on a subject which must largely be governed by feeling and educated taste.

A very excellent effect is produced by a narrow margin of india-paper immediately around the print; or of what is now commonly used as a substitute, a tint produced on the mounting board by lithography, in imitation of india-paper. This tint often gives great value to the whites of the photograph, and general relief to the tone of the picture. In some cases a good effect is produced by leaving a somewhat larger margin at the bottom than the top. In card portraits, for instance, it is better to leave about half-an-inch at the bottom, and about one-eighth of an inch all round. In all cases it is desirable to avoid intersecting corners; that is a line drawn diagonally through the mount, should not intersect the corners, first of the india-paper tint, and then of the print. Where the corners thus intersect, the effect is inevitably formal.

The next point for consideration is the best adhesive material, and the best method of using it. A great variety of materials have been recommended for this purpose, amongst which gum, dextrine, pastes of various kinds, glue, india-rubber, &c., have been chiefly used, and each has had its advocates. I do not propose to enter into any extended discussion of their respective merits, but just to offer one or two remarks on the subject.

The qualities necessary in any such material are that it should be easy to prepare, easy to use, efficient when used, and free from deleterious effect upon the photograph. Gum has the disadvantage, if thin, of sinking into the paper and showing on the face of the picture. It has moreover the tendency to rapidly turn acid, and if used in this state it injures the photograph. Making it with boiling water reduces the tendency to acidity or decomposition; and if made thus and used sufficiently thick, I think it may be used without disadvantage. Dextrine I have not used, but I believe there is no positive objection to its use. Of the various kinds of paste that made of starch is preferable, and if used fresh, is, I believe, perfectly safe. I prefer the patent starch, in powder, and without the blue tint for my own use. I may here describe a simple and efficient method of making it. I take a teaspoonful of the powder, and put it into a common marmalade jar, this is then mixed with the smallest quantity of water, which will make it into a thick paste. When it is rubbed perfectly smooth, boiling water is poured on it, the whole being rapidly stirred. Sufficient boiling water is used to make a thick transparent jelly, and one good teaspoonful of the powder will make a jarful of paste. This will keep good a few days in summer, and longer in winter. It is easily made, easily used, efficient, and will not, if used properly, injure the photograph.

Glue, gelatine, isinglass, &c., are used by some. Of these I think good Scotch or Russian glue will be found best. This for persons only mounting occasionally will be found troublesome to prepare and use, but it is very efficient, and I believe safe.

I may here refer with advantage to some experiments undertaken, and detailed to the Photographic Society of Scotland a few years ago, by Mr. Colin Sinclair. His object was to determine the effect upon the permanency of the print exercised by the various materials used for mounting. I will read one or two extracts from his report.

"I prepared a small quantity of each of the substances already named, (starch, albumen, isinglass, and gum-arabic), in separate dishes, and selected two of Mr. Tunney's photographs, one of them of the brown tint on albumenized paper, the other of the black tint on plain paper. I cut each of the two prints into five pieces, the fifth piece being laid aside for future comparison, and then distributed the four pieces of each picture over the four dishes containing the different materials, so that there were two pieces completely immersed in each dish. They were kept there for one month.

"I would have allowed them to remain longer in this state, but the pieces became so fragile, that I could hardly remove them from the liquids in which they were immersed. After cleaning the pieces, I mounted them along with the fifth piece, so as to show the relative effects on each, and I now lay the mounted results before you.

"It will be observed that the brown photograph on albumenized paper has suffered the most, especially the piece that was immersed amongst the albumen,—it has given way very much; the pieces that were amongst the isinglass and the starch are slightly affected; that which was in the gum is the least changed of any, while the black picture on plain paper has come out of all the four different substances much the same as it was."

Conceiving that it might be more satisfactory still to test the keeping qualities of pictures mounted with these materials, he took two other photographs and cut them each into five pieces, mounting four of the pieces, each with a different material, and keeping one piece unmounted for comparison. These mounted pieces were then placed in a damp cellar, where all the conditions generally considered averse to photographs were present in an exalted degree, and kept there for twelve months. At the end of that time they were submitted to the Scottish Society. I will read a brief extract from the report. Mr. Sinclair says :—

"The fifth piece, lying on each cardboard in juxtaposition with the mounted pieces of the pictures, shows the original colour, from which it will be observed that the whole tone is somewhat changed, but still indicating the superiority of the starch and the gum-arabic for mounting photographs.

"In the first experiment—that of steeping—the plain paper photograph, of a black colour, was less changed than that on the albumenized paper; but the result is reversed in the two mounted pictures—the one on plain paper, of a brown colour, being more injured than the other. This may be partly accounted for by the black-coloured picture having been a stronger print. The four photographs thus tested had been well washed with warm water, otherwise they could not have withstood the treatment so well as they have done, as is evidenced by the third picture in the hands of the members, which from its tone did not appear to have got justice in the washing, and was only about a fourth of the time in the cellar along with the others.

"As regards convenience of application, I prefer starch when mounting photographs, as it can be used with greater facility and cleanliness than gum-arabic, which, however, is very useful for an occasional picture, as it is inconvenient and not worth while making fresh starch every time an amateur requires to mount a few pictures."

From these experiments it would appear that Mr. Sinclair found starch and gum the most conducive to the well-being of the photograph. My own predeliction is in favour of starch, simply because I have found it so easy to prepare, and because as it will not keep, it must be prepared fresh; there is not, therefore, the same temptation to use it when unfit, which there is when a bottle of gum it kept for occasional use. I have heard the objection used to starch that it might generate acid even after the picture is mounted. I have no fear, however, that the dry particles of starch, by which my prints are made to adhere to the mounting-board, will produce me either sugar, alcohol, or acetic acid.

There is, however, another consideration which, under some circumstances, will influence the decision as to the adhesive material to be selected. There are two sources of trouble in mounting to which I have not yet adverted—curling and cockling. The cause of both these troubles is this: the print on being coated with paste or gum becomes saturated with moisture and expands, it is mounted on the board in this expanded condition, and as the moisture evaporates it contracts again to its original size, or even less, and draws with it the board on which it is mounted. Where there is a margin of board all round the print, "cockling," or uneven contraction often results. It will readily be seen that those substances which contain the most moisture, such as gum or starch, will produce those evils in the greatest degree. Where the pictures are mounted with a margin, this is an important consideration, and for this purpose it will be found that glue causes the least trouble. In using it the print does not expand much, and there is consequently little contraction. The curling, &c., may also be obviated by sponging the mount before laying down the print, so that both shall be equally expanded. The plan described some time ago by Mr. Stuart, of Glasgow, is also a good one for preventing this defect. Each print is covered with starch paste before trimming. and then dried. When they are to be mounted they are trimmed and shaped, the board, slightly wet, and the print placed upon it in position. The two are then passed through a lithographic press, which brings them into firm contract and completes the operation.

I may here mention a little hint which will be found of great service to those who have large numbers of card pictures to mount. When the prints are very stiff and dry much, it is difficult to cover them with the starch, without their curling up, and smearing the surface. To prevent this take a clean sponge and damp a few dozen before pasting them, they will then lie perfectly flat, and cause no difficulty. Although this involves two operations it will be found an actual saving of time.

I will, in conclusion, just refer to the use of india-rubber paste. This is scarcely suitable for general mounting purposes but is invaluable for fixing prints in albums or scrap-books. A slight touch of the paste at each corner attaches the print to its place in the scrap-book, and keeps it perfectly flat, without the slightest contraction, or "cockling." The paste is made by dissolving shreds of india-rubber in chloroform or benzole.

I now invite inspection of a variety of specimens I have brought to illustrate my remarks, and add, that the bulk of them—all those with the India paper tint—were mounted by Mr. Fox, of Little Britain, whose neatness, skill, and taste, in mounting generally, I can commend in the highest terms.

I have not said anything here of hot-pressing or rolling, but I may conclude by observing, that I consider it indispensable to perfect results.

PHOTOGRAPHY ON WAXED PAPER.

BY DR. LORENT.

For the representation of animated nature there is certainly no better process than wet collodion. Albumen, or dry collodion, claim the preference of the photographer when he desires to take architectural views and other inanimate objects, when the dimensions of his pictures do not exceed 21 by 17 inches. But when a larger size is required, and especially for the purposes of the travelling photographer, no method is comparable with that of photography on paper, not only from the facility of its manipulations, but also for the lightness of the travelling equipment and the certainty of the results. I must confess myself astonished that this method is not more generally practised, for the results may favourably compare with those obtained on glass. If the proofs are not quite so sharp, they present more stereoscopic effect, which is always pleasing, especially in large pictures intended to be viewed from a distance; besides, there is more *colour* in positives obtained from paper negatives.

I always employ waxed or turpentine-waxed paper; albumen paper does not keep long enough when dry, especially during summer. As for albumenized waxed paper, it keeps very well, but the albumen leaves the paper too readily when rolled. Paper simply waxed gives the same degree of sharpness if the focus has been accurate during exposure. Another advantage attending its use is, that it does not discolour the solution of aceto-nitrate of silver which then requires to be purified by kaolin or other means, and causes a great loss of time in filtering at every preparation of the sheets of paper.

It is best not to choose too thin a quality of paper, as it shows the unevenness of its texture by transparency. I always use Marion's paper marked No. 112 in their catalogue.

It would be superfluous to enter into details intended for beginners, or into a description of the method of waxing which is a long and tedious operation, and which the photographer would best avoid by purchasing the paper ready waxed. I therefore proceed to the first operation.

Iodizing the Paper.

Of the different solutions proposed for this purpose, that which has constantly given the best results is composed of

Distilled or rain water	1000 parts
Iodide of potassium	30 ,,
Bromide of potassium	10 ,,
Iodine (pure)	½ ,,

The iodine will quickly dissolve in a concentrated solution of the two salts of potassium: for that purpose, dissolve these latter in a small quantity of water, and then add the iodine, and after the solution is complete, the remainder of the water.

The waxed paper is floated upon the solution, and afterwards wholly immersed in it with the aid of a glass rod. The greasy surface of the waxed paper usually presents some difficulty in becoming moistened with the solution, but it may be facilitated by brushing the surface with a camel's hair pencil. Immediately the iodine comes in contact with the paper, it colours the starch contained in it of a violet hue, which is advantageous in the succeeding operation of sensitizing, and serves to fix the time of contact with the silver bath, by the change produced in the colour of the paper.

We can put in the same bath a dozen to twenty sheets of paper in succession, according to the quantity of the solution, which ought to cover them completely. The whole pile of paper should remain immersed four to six hours, then withdrawn sheet by sheet, and suspended to dry in a place free from dust.

When the sheets of paper are quite dried, they are placed in a portfolio, where they may be kept an indefinite time. I have made use of paper that has been iodized three years, and the results obtained were as good as upon paper newly prepared. It is probable that the paper continues in good condition as long as it remains coloured by the iodine.

The bath of iodide of potassium may be used until exhausted; every time a number of sheets are prepared, it is found that all the free iodine being absorbed, the liquor loses its orange yellow colour, and assumes that of a pale straw yellow; before using it again, some crystals of iodine should be added, until it resumes its primitive colour.

Sensitizing the Paper.

Make the following solution—

Distilled water	1000 parts
Nitrate of silver	100 ,,
When dissolved add—	
Glacial acetic acid	200 ,,

It is well to prepare two quarts of this solution in two separate bottles; the first will serve to sensitize the paper, the second to refill the first bottle as fast as it is used, and also to furnish the aceto-nitrate of silver solution which is mixed with gallic acid during the development of the negatives: for a solution which has served for preparing paper would form a precipitate too quickly by decomposing the reducing agent.

In sensitizing the iodized paper, we can, if desired, have the image on the surface, or which, I believe, is preferable, in the texture of the paper. If we float the paper upon the solution without immersing it, and leave it until the back of the paper changes from violet to yellow, the image will be impressed on the surface exposed to light; but if, on the contrary, the paper is immediately immersed in the solution by means of a glass rod or a soft brush, the image, during development, will at first show itself on the back of the paper; upon examining the paper on the side which has been exposed to light, the image will not appear very distinct by reflected light; but when viewed as a transparency, we shall be astonished at the amount of effect and detail apparent.

In either case, immediately the paper is floated on the aceto-nitrate of silver in a dark room, or one lighted by a small taper, or illumined through green or yellow glass, it must be examined to see that no bubbles have formed on its surface. Bubbles manifest their presence in the subsequent operations, as the paper does not change its violet colour in those places which are not moistened by the nitrate of silver, and if we are slow in removing it. there will be a difference in sensibility at the spot, and, of course, a blemish in the picture. When the paper has assumed a pale straw colour, it is allowed to remain yet three or four minutes, to make sure that there is no undecomposed iodide of potassium in the paper, then it is lifted out, held to drain a few moments, and then immersed in a dish containing distilled water.

If the paper is somewhat thick, no harm will result if it be allowed to remain in the aceto-nitrate bath ten or fifteen minutes; but on the other hand, if any iodide of potassium remains in the paper, the image will be covered with a quantity of small white spots, insensible to light, which necessitate a tiresome task of retouching, and which is sometimes also very difficult; this accident will sometimes occur in spite of every care, owing to the bad quality of the paper.

After having prepared the last sheet, which is allowed to remain at least five minutes in the washing dish, all the sheets are removed one by one, and dried between sheets of blotting-paper which is twice changed. The paper is afterwards gummed round the edges with a solution of gum-arabic, and they are fastened by it to the back of the negative frame. We can place the prepared sheets of paper behind a sheet of white glass, fixed within the negative frame, without prejudice to the sharpness of the image; but then the frame becomes much heavier, which forms an important consideration when working a large size, and in travelling there is the risk of breakage to be added. Some photographers recommend a repeated and prolonged washing to avoid granulation of the paper, and to make it keep a long time; but the granulation is due to the bad quality of the paper; and with respect to its keeping, it may, perhaps, be useful if we aim only at obtaining a view of an edifice, without attaching any value to the quality of the proof. If, on the contrary, we desire to obtain fine negatives, we must expose the paper and develop the image as soon as possible after sensitizing. The paper which still retains traces of humidity will yield the best proofs.

It may be asked, why employ waxed paper if it will not keep well? I reply, waxed paper will always hold good for a day. The wax stops the pores of the paper, and renders it homogeneous, and prevents the nitrate of silver from reacting upon the ligneous fibre. If, from any cause, we are prevented from making use of sensitized paper during the day, we can reimmerse it in the iodizing solution, where it will reassume the violet hue, but of a lighter tint than before, and may then be dried and preserved as paper that has been simply iodized.

After paper in several quantities has been prepared in the aceto-nitrate solution, the latter becomes stained by the reduction of the silver; it is only necessary to filter it to restore its clearness, or simply to decant it, because the particles of oxide of silver, if they are not too numerous, are carried off in the washing water; kaolin is never necessary to remove the colour of this solution.

A quart, or three pints of the solution of nitrate of silver of the strength indicated above, will serve to prepare 50 sheets of paper, 17 + 22 inches; it then becomes impoverished in its salt of silver, but rich in nitrate of potassa. The old solutions are more sensitive, but also more quickly decomposed. The negatives they yield are never very strong; the parts that should remain white are sullied. During the course of last summer, I took at Venice 50 negatives, 21 + 32 inches; when the silver solution diminished, I always refilled the bottle with new solution. Upon the completion of my task, I precipitated all the silver in the bottle (which still contained 1,200 grammes of solution), with hydrochloric acid; the remaining liquid, after evaporation, which I did from curiosity, gave a residue of salts of potassa which weighed 65 grammes.

The time of exposure of the paper in taking a view, differs, of course, with the objective, the length of its focus, and the object to be copied. The distance of the object is of great importance; if it takes fifteen minutes to copy a very near edifice of a sombre colour, five minutes will be sufficient for a statue in white marble with the same apparatus.

(*To be continued.*)

PHOTOGRAPHIC CHEMICALS:

Their Manufacture, Adulterations, and Analysis.

Phosphoric acid.—By far the most important phosphorus compound, both scientifically and commercially speaking, is its highest oxide, phosphoric acid, which consists of one equivalent of phosphorus to five equivalents of oxygen. This substance is formed whenever phosphorus is burned with free access of air; in the state in which it is then produced it is in what is termed the anhydrous condition, and is put to a great variety of uses in chemistry and other branches of science on account of its intense affinity for water, an affinity, the energy of which surpasses almost everything of the kind known in chemistry; flakes of the anhydrous acid hissing like a red hot iron when they are dropped into water and uniting with the latter with a power which no chemical force can overcome without decomposing one of the constituents. It is on this account that anhydrous phosphoric acid is so much used for the purpose of absorbing water from gases, &c., which it does in a more perfect manner than any other reagent. It is prepared by burning phosphorus in dry air or oxygen gas. A small portion of phosphorus is rapidly dried between blotting-paper and placed in a small dish in the centre of a dry flat plate: it is set on fire by touching with a hot iron, and then immediately covered with a dry inverted bell jar of a capacity of about 200 or 300 cubic inches. The flakes of anhydrous acid produced by the combustion rise up and are deposited as a light snowy-looking substance on the sides of the jar and on the plate. If more acid be required, a fresh piece of phosphorus may be introduced when the first is consumed, and, the air in the jar being renewed by holding the latter up for a few seconds, the combustion is proceeded with as before. The resulting acid must be rapidly scraped off the sides of the jar with a flat spatula or card, and then transferred to a perfectly dry, well-stoppered, wide-mouthed bottle for future use. In this state phosphoric acid presents the appearance of white flakes, which rapidly deliquesce upon exposure to the air, to a colourless liquid, inodorous, not corrosive, and of intensely acid but agreeable taste. In combination with water or bases, phosphoric acid occurs in three different isomeric states which render the study of the phosphates peculiarly complicated and difficult to master. We will briefly glance at so much of these conditions as appear likely to be of use to our readers, and then confine our remarks to the modification generally met with.

Our readers are aware that most acids, when they form salts, combine with one equivalent only of the metallic oxide; thus, nitrate of silver is formed of one equivalent of nitric acid, and one equivalent of the oxide of silver. Nitric acid, therefore, is called a *monobasic* acid, as it requires one equivalent of base to saturate it and form a neutral salt. Tartaric acid, however, requires two equivalents of base to one of acid to form a neutral salt, and is, therefore, called a *bibasic* acid. Citric acid is an example of a *tribasic* acid, or one which requires three equivalents of base to one of acid to form a neutral salt. In speaking of the constitution of salts, it must, moreover, be borne in mind that *water* may, and does act as a base; thus, nitric acid is strictly speaking, a nitrate of water, &c., just as we speak of nitrate of silver. Now, in bibasic and tribasic acids, the two or three equivalents of base which are required to saturate the acid need not be the same base, we can have one equivalent of one base, a second of a different base, and a third of a third base; and, moreover, any one or two of these bases can be replaced by water. Thus, in chemical symbols, calling the radical of tartaric acid T; potash KO; and water HO, the ordinary tartaric acid would be represented by

$$\left.\begin{matrix}HO\\HO\end{matrix}\right\} T,$$

whilst acid tartrate of potash would be

$$\left.\begin{matrix}KO\\HO\end{matrix}\right\} T,$$

cream of tartar would be

$$\left.\begin{matrix}KO\\KO\end{matrix}\right\} T$$

and Rochelle salt (double tartrate of potash and soda).

$$\left.\begin{matrix}KO\\NaO\end{matrix}\right\} T.$$

It is thus seen that a monobasic acid has one vacant space, which always be filled up either by water or a metallic oxide, whilst bibasic and tribasic acids have respectively two and three vacant spaces, each of which must be filled by some substance having basic properties, but any different base may be used to fill up any space.

The difficulties in the way of a correct understanding of the different modifications of phosphoric acid will now be readily appreciated, when we say that this acid is capable of existing in all three states, either as a monobasic acid, known by the name of metaphosphoric or *a*-phosphoric acid; as a bibasic acid, called pyrophosphoric or *b*-phosphoric acid; and as a tribasic acid, known as *c*-phosphoric acid; and the complications are not lessened by the fact that these different acids are capable of changing one into the other, sometimes by simple ebullition of the solutions of their salts, and in other cases by ignition. Fortunately for photographers, the last modification—the normal condition of the acid, as it may be called, is the one easiest obtained and the most useful for their purposes, although from all varieties of the acid and its salts being known under the general name of phosphoric acid and phosphates, it has frequently happened that an amateur has got hold of the wrong body for his experiments; and as their properties are very different, the results obtained will be different from those anticipated. In the subsequent description we will confine ourselves to the ordinary tribasic phosphoric acid.

The solution of this acid may be readily obtained. When the anhydrous acid is dissolved in water, and the solution boiled for some time, it is quickly converted into the tribasic modification. In order to free it from some lower oxides of phosphorus which may possibly be present, the solution should be mixed with nitric acid, and evaporated until all the nitric acid is driven off. Upon heating this still further, the excess of water evaporates until what is left solidifies on cooling to a soft glassy substance, which is known as phosphoric glacial acid.

Another way to prepare phosphoric acid is to heat phosphorus in a retort with nitric acid. The phosphorus is oxidised at the expense of the acid. This process, however, is somewhat unsafe in inexperienced hands, and is, therefore, not recommended so much as the preparation by combustion. On the large scale, and when absolute purity is not required, phosphoric acid is prepared from burnt bones, which consist almost entirely of phosphate of lime. This plan is, however, not recommended for photographic purposes, as it is difficult to obtain it pure. A great deal of the glacial phosphoric acid which is met with in commerce is shamefully adulterated. We purchased some a few months ago at a respectable house, where we were assured it was pure. It was done up in little wide-mouthed ounce bottles, carefully corked and waxed over, and labelled "acidum phosphoricum." The acid was in nice-looking transparent lumps like glass. To our astonishment, when we attempted to make a solution of it, the lumps refused to dissolve in water, and upon examination turned out to be nothing but super-phosphate of lime with excess of acid. We have been particular in describing the appearance of the bottles, as we believe large quantities of this trash is imported from Germany, where the bottles are filled and got up in the manner above described. We need not say that superphosphate of lime, although an excellent manure, is not a good substitute for phosphoric acid, especially in photographic operations, where slight traces of impurities are often of great consequence.

Phosphoric acid may contain as impurities,—*Phosphorous acid*, which is detected by the solution giving a blackish instead of a yellow precipitate with subnitrate of mercury; *Metaphosphoric acid*, which is shown by its silver precipitate being white instead of yellow; *Sulphuric acid*, which occasions a white precipitate with chloride of barium, insoluble in hydrochloric acid; *Nitric acid*, which occasions the solution to evolve red fumes when heated with copper; *Ammonia*, which may be detected by the smell upon adding an excess of potash; *Lime*, which is precipitated by oxalic acid, after nearly neutralising with ammonia or potash; *Magnesia*, which is precipitated by adding excess of ammonia; *Arsenic*, which causes a yellow precipitate when sulphuretted hydrogen is added to the solution; *Sesquioxide of iron*, which causes a red colouration when a drop of sulphocyanide of potassium is added; and *Oxides of lead and copper* which are precipitated black by sulphuretted hydrogen.

The aqueous solution of phosphoric acid is of the consistency of a syrup when concentrated. It gives a white precipitate with baryta, strontia, or lime-water, or acetate of lead, does not precipitate chloride of barium, and gives with nitrate of silver, upon the addition of a small quantity of ammonia, a bright yellow-coloured precipitate.

Of the salts of phosphoric acid, which are of value in photography, we shall speak in our next article.

HINTS FOR WORKING WITH CLEAN HANDS.

Sir,—I seldom stain my fingers or my plates.

I use a pair of OLD worsted or cloth gloves for removing the plate from the bath to the frame, and a pair of leather gauntlet gloves (common housemaid's gloves will do), for developing.

The worsted or cloth gloves are very elastic, their former wear has worn down the pile, and the *ends* of the thumbs and fingers fit close.

Keeping my old winter gloves for this purpose, I have always two or three pairs at hand, and after a few plates, for fear of stains, I use a fresh pair.

I remove the plate from the frame by a pneumatic holder, but I only trust to it to bring the plate to a horizontal position, with the film upwards; then with one of the fingers of the hand which holds the plate, I unslip the lever of the holder.

The plate now being loose, it is easy to transfer it to the wooden plate holder (which I shall describe hereafter,) without injury to the film, as it rests partly ON the fingers, BELOW, and partly AGAINST the thumb at its side.

The coarse leather gloves, worn during this part of the operation, may be made more convenient and safe by a gusset of leather being inserted under the thumb, and by the ends of the fingers being rounded. I have always two or three pairs ready, in case of one pair, by accident, becoming wet through. Holding the plates as I have described, this would not affect the film; but it is disagreeable to work in wet gloves.

I send you models of my plate holders; the first is of glass, for 12 + 10 plates, say about 11 inches long, by about 4 inches wide; it has a thin strip of glass glued on to one end, which forms a sort of handle, and also keeps the plate from slipping while the collodion is poured on. The back of the plate and the surface of the holder being both dry and clean, the former resting on the cross strip, has no tendency to slip, and in pouring off the waste collodion, by the aid of the mouth of the bottle, it may be held nearly vertically.

The plate is thus covered to its four corners, and no impurity on its back can injure the bath.

The second holder is of wood. I varnish mine; it is so made that the developing mixture can hardly reach the hands, even if gloves were not worn. It is difficult to describe it—call it a *short*, *broad*, harlequin sword, with a guard between the blade and the handle, so contrived that all liquids poured on the blade shall run off without reaching the handle. A long slit in the centre of the blade allows the progress of the development to be examined.*

The developing plate holder rests on a tumbler or gallipot; this is placed on a low stool, which stands in my sink. The legs of the stool are of such a length as to raise the plate to a convenient height for watching the flow of the liquids; but as I keep the developing solution in constant movement, pouring it off and on frequently, the holder is more frequently in my hand than on the rest. All this is simple and inexpensive, and nothing can get out of order.

My first idea of these holders was taken from a French work, (Brebisson's.) At first I used only the glass holder, steadying the plate by inserting a small piece of wet blotting paper between it and the holder: it acted admirably, and was most convenient; but it does not save the hands from stains so well as the one I now use in developing.

Whatever may be the merits of the holder, I am sure that much of my success in avoiding stains arises from my having two holders, each kept for its own purpose; and from my having different sets of gloves, one set being used solely for removing the plate from the bath to the frame, the other being kept for the developing, fixing, and washing operations. When I used but one pair of "gauntlets," stains on the film were sure to appear after the second plate, sometimes after the first. I have the honour to be, sir, your obedient servant, N.

Photographic Tourist.

MY FIRST PHOTOGRAPHIC TOUR.†

The ancient city walls, said to have been laid so low by that terrible Fairfax, have many relics over which I frequently stumbled in my rambles about the town. In places these fragments are still tall and strong, but most frequently their rugged barriers of ancient masonry are mere mounds, and peering in their grim ruin from picturesque nests of luxuriant ivy, creeping, and flowering plants, and thickly growing grasses and weeds, help to form very pleasing pictures.

If you are fond of "close scenes," as we artists call them, you will find many such about Colchester: winding, narrow roads, ascending or descending and losing themselves in the shade of tall hedges and overhanging trees, through whose trunks charming glimpses are caught here and there of sunny hill sides and shady valleys, of heaven-pointing church spires, and clumps of rounded foliage, in all their varied hues and colours, and with a most pleasing diversity of harmonious light and shade. Not far from the town, and close by the village bearing their name, are the Lexeden Springs, where a choice collection of such views may be got, and from which spot I secured several sketches. One of the large shallow basin of pure, colourless and brilliant water, where the springs rise under the out-spreading boughs of some very fine trees; one, of a yet shadier nook, where the trees are more closely planted, and the glassy sheet of purely transparent water glides over gleaming, purple, green, golden, and ruby pebbles, breaking every now and then the monotonous little chattering sound with which it pursues its sparkling course with a tinkling musical splash or two; one of another spot where, diminished to a silver thread, it steals secretly amid the grass-blades, which, nevertheless, mark its way with a fresher and more brilliant green; and of yet another, where, passing under a rustic bridge, it grows bolder and broader, and flashes joyously from its sweetly quiet and beautiful little birth-place out and away in the full unshadowed glow of sunny daylight. Ah! many a happy hour, never, never to return, we spent in the scenes my memory can so imperfectly but tenderly recall; when the dear one, now no more, sat beside me with her needlework or book, and the camera began to take that place in my affections which I once thought nothing but my brushes and palette could ever fill. I can recall many such spots, the discoveries of as many never-to-be-forgotten rambles; but I have already sufficiently indicated for the purpose of our landscape photographers how rich this portion of the country is in their particular requirements, and may now turn to matters relative to my own experience in portraiture, &c.

Having procured better apparatus from one of the London dealers and so got ready for a second appearance as a Daguerreotypist. I secured apartments at a pastrycook's, nearly opposite the little old church tower with the clock, and, in a large front room with a big window, contrived to get my pictures, not very perfectly, it is true, but so far so, that, luckily enough, I succeeded in pleasing the greater number of my patrons. At first I used to place my sitter as near the window as I could, with one white screen on the shadowed side, but finding that the contrast of equal white and equal black was too harsh and strong when the model was illuminated in this "half and half" style, soon altered this, and placed the sitter very much farther in the room, with the face more fully towards the light, and with *two* white screens, one on either side. By so doing I lessened the action of the lighted parts, and obtained more even chemical results from the entire image, although the exposure was certainly more prolonged. I effected some improvements in this respect afterwards by using a metallic reflector in the place of one of the white screens.

Shortly after I came into this town, it was in all the ferment and excitement of the general election; flags were flying, bands were playing, ribbons, orange and blue, were displayed on hats, in button-holes, and bonnets; processions of carriages and equestrians were continually forming, headed by bands and banners; men bore huge printed placards stuck on poles, or hung about their necks, through the bustling thoroughfares near the committee-rooms; hot, strong, and loud arguments were heard in the tap-room and parlour of every inn, strife was rife, and physical arguments were unhesitatingly taken up when moral failed; stupid, fishy-eyed yokels, husky of voice, and uncertain of step, shouted for "*cheap beer*," and thin, sun-burnt, hard-handed women, shabby of dress, and hollow of cheek, cried earnestly for "*cheap bread*;" there were scramblings for half-pence, and burnt fingers among the eager poverty-stricken, quarrelling, and fighting scramblers, whereat gentlemanly practical jokers laughed uproariously, and their smarting victims grinned with difficulty. There was a fair allowance of bad blood spilt, and much good ale and wine; a good many hats were crushed, and many garments torn. Cheers and groans, applause and hisses greeted both candidates, who, of course, were both equally certain of success; many speeches were spoken, very few were audible, even little, gleeful, ignorant children were carried away by the common spirit, and had little party squabbles over their tiny blue and orange flags, and no portion of the population were more excited, more noisy, more seemingly deeply concerned in the interests at stake, than, as usual, the dogs, which, running here, there, and everywhere in hot haste, barked, and panted, and seemed as if the whole important business of the great event was dependent solely and entirely upon their most energetic and active superintendence and inspection. There was a strong display of ancient enmity, much spite, and no little malice, but there was an amazing deal of talk about friendship. Well-fed, fashionably-attired

* We intend submitting the model to some manufacturer; and it possibly may be introduced to the public commercially.—Ed.

† Continued from p. 522.

farmers, who seemed tolerably able to befriend themselves, talked continually and excitedly about "the farmer's friend," and poor folk talked energetically about "the poor man's friend," and reformers boasted "the friend to reform," and patriots "a friend to the country," and others about "the friend of the people," or "a friend to the town or county," or "the friend of commerce," or no end of boastful friends, to no end of objects and purposes, in apparently urgent need of friendly aid. For myself, I was heartily glad when all this fuss, and bother, and turmoil, and scheming, and plotting, and squabbling, and fighting, were over, the polling-booths down, and the town in its usual peaceable state.

Among my acquaintances here, were many an amateur, and one professional, follower of Daguerre. The amateurs were very earnest in the pursuit of excellence, but were a sadly long way from its attainment, although the professional gentlemen was certainly not much in advance of the rest; but they were all of opinion that the superior character of the more beautiful productions which they sometimes saw, not mine—oh dear no!—was due to the possession of some peculiar and never explained process, or jealously guarded secret, and was certainly not due to the process as practised by themselves; or, look you, "why couldn't they produce the same results." A foolish species of reasoning not yet extinct among amateur photographers, and which, as I afterwards heard, laid these particular individuals open to the cunning of a certain crafty Scotchman, who coming into the town in a house on wheels after my departure, and taking very good pictures, sold these simpletous all sorts of trivial or valueless hints—as secrets to which he owed his success—for sums ranging from five to ten and fifteen guineas; the said hints being merely such as he had derived from the *Journal* of the Photographic Society, a serial not then known in Colchester.* These amateurs seemed lost in wonder that I, a professional, had *no secrets*, and most of them thought but little of my pictures or myself in consequence thereof, but, although I saw all this very plainly, I, who would fain be an artist, could not stoop to the petty tricks of the charlatan.

My patrons here were very varied in position and character. I had bluff, hearty, honestly pig-headed, good fellows, whose pictures were to be taken "Oh, anyhow," or "Just as they were," being *only* to please the "*whims*" of their wives or daughters, and who scarcely deigned to give their finished miniatures a second glance; and I had finical little fops of scrupulously critical shopmen, with an intense horror of shadows on their faces and creases in their apparel. I had ugly women, with an inordinate appetite for flattery, for which every speech they uttered was full of fish hooks, whose pictures had "*never* been taken" (and never would be) "although they had sat ever so many times;" and I had pretty girls, who took anything but flattered portraits, with an air of perfect contentment. I copied precious portraits, the sole relics of the loudly lamented dead, some of which, *together with the originals*, I still have in my possession, the owners who so solemnly impressed me with the tremendous importance of preserving them from injury, never having called again for them. And I copied one wretched fading Daguerreotype of a private soldier, who had died abroad, for a poor old withered ugly woman, in patched and shabby poverty, who had positively gone without animal food for many months, and came a-foot from a village many miles away, in order that she might secure a copy of the sister's picture of a son who died four years before. Poor old girl! my dear little wife had some difficulty to refrain from embracing the dingy little old crone, so touched was she with the truth and intensity of her quiet grief, and undemonstrative affection. Then I had "ladies," who would insist upon so holding their hands that they resembled the stuffed gloves of a boys' Guy Faux, in order to display their rings; and "gentlemen," who were very indignant that the position chosen did not display the full costliness of their albert chains; in short I had, during the four months of my stay in Colchester, the usual amusing variety of sitters, and met in them the peculiarities familiar to every practitioner of our art, in its department of portraiture.

When I left Colchester it was to visit friends and relatives in London, and thus ended my first, although by no means my last, Photographic Tour, the humble account of which has, I hope, at least contributed to your amusement.

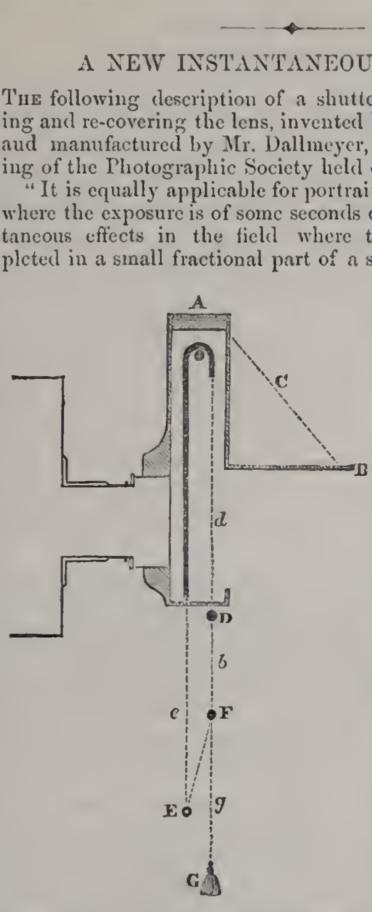
R. A. S.

* Only the other day I heard from a country friend that this same Scotchman does quite a large business in such secrets, having just received five pounds for "a background dodge," which has more than once been fully explained and denounced, both in these pages and those of our contemporaries.

A NEW INSTANTANEOUS SHUTTER.

The following description of a shutter for rapidly uncovering and re-covering the lens, invented by Mr. F. R. Window, and manufactured by Mr. Dallmeyer, was read at the meeting of the Photographic Society held on the 5th.

"It is equally applicable for portrait lenses in the studio, where the exposure is of some seconds duration, or for instantaneous effects in the field where the exposure is completed in a small fractional part of a second.



"It consists of a small box, A, which fits on to the hood of the lens. The front, B, when in use, is kept open by means of an elastic, C, and serves as a shade to the lens.

"Inside the box, at the top is a roller, working on points at each end. Over this roller passes the shutter, which is of a flexible material composed of wood strips upon leather; this is represented in the section we have given by the thick line. From each end of this curtain, or shutter, depend strings, *d* and *e*, terminating in the rings D and E. Another string, *f*, joins these rings together, and finally from the ring, F, placed in the middle of *f* proceeds the string *g*.

"By referring to the cut, it will be seen that when either ring, D or E, is pulled down as far as it will go, the shutter is entirely closed. If it be now desired to uncover the lens for a definite time, as for a portrait or dry plate landscape, the string, *g*, is pulled down, which will raise the shutter halfway, and fully uncover the lens. When it is wished to re-cover the lens, either of the rings, E or D, is drawn down as far as it will go, and the object is effected. If an instantaneous exposure, as it is termed, be desired, that is, one of only of a fraction of a second in duration, the ring, D, as shewn in the drawing is pulled down as far as it will go with the speed required, and this one movement will open the lens and also reclose it. It will be noticed that the after part of the shutter rising, the lens is uncovered from the bottom, and the foreground is the first thing exposed; and the front part of the shutter descending, the lens is re-covered from the top, so the foreground is the last thing exposed.

"This instrument, therefore, supplies what has long been a desideratum, the means of rapidly uncovering, *and* re-covering a lens by one continuous movement; which avoids shaking the instrument, and at the same time of giving to the foreground a longer exposure than to the sky, and remaining portions of the picture.

"The time of exposure with this apparatus is perfectly under control, the motion being made with the hand; a very little practice would suffice to enable the operator to regulate it with the greatest accuracy."

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 20th November, 1861.

At the adjourned meeting of our Photographic Society, several of the members presented the results of their summer excursions in various lands. Conspicuous among them were the views in Switzerland, executed by Messrs. Bisson, frères. Of these, the panoramas of Mont Blanc and Mont Rosa excited the warmest admiration, which surpass in excellence anything of the kind hitherto seen, both in perfection of the detail and the harmonious tone of the proofs.

A series of proofs printed from negatives taken by Major Russel's tannin process by M. Anthony Thouret, an amateur, excited much curiosity, and are very creditable to the talent of the operator, besides showing in a very satisfactory manner the capabilities of this new process. Some very excellent views taken by Taupenot's process, by M. Jean Renaud, displaying high artistic skill and taste, also called forth much admiration. M. Migurski also exhibited a striking collection of views in Russia, together with portraits and types of various races; these were taken by various processes; some of large dimensions obtained by enlargement, in iodised paper, in two seconds, were much admired.

There is a good deal of photographic litigation going on here at present. M. Quinet is especially prominent in litigation, and it could not well be otherwise from his practice of patenting other people's inventions, old and new. It is probable that M. Poitevin, whose name is so honourably associated with photolithography and carbon printing, will become involved in a law-suit with M. Fargier, of Lyons, who obtained at the close of last year a patent for carbon printing by a process identical with that patented by M. Poitevin in 1855.

Here, as in England, patents are granted without examination of the merit or originality of the claims; consequently, it frequently happens that patents are granted for the same invention to two or more applications. A much better practice obtains in the United States, where the Patent Office undertakes to examine into the originality of claims, and only grants patents to original inventions.

Some specimens of the photographs obtained without the employment of salts of silver by a process announced as discovered by M. Wothly, of Aix-la-Chapelle, and mentioned in one my letters a few weeks ago, have recently been exhibited. The results are remarkably good. M. Girard, who has made a chemical examination of them, thinks they are formed of gallate of iron. If such be the fact, the process by which they are obtained has no claim to novelty.

Ozone has been suggested by Gorup-Besanez as an effective and convenient agent, when properly applied, for restoring books or prints which have become brown by age, or been smeared or soiled with colouring matter; only a short time being required to render them perfectly white, as if just from the press; and this without injuring, in the least, the blackness of the printing ink, or the lines of the crayon drawings.

As examples of his results, the author mentions a book of the sixteenth century, upon a page of which several sentences had been painted over, by the monks of that epoch, with a black, shining material, so as to render them illegible, and of which no trace of a line could be detected. After 36 hours' treatment with ozone, the colouring matter was entirely removed, and the most careful scrutiny of the page failed to discover that any of the lines had ever been painted over. In like manner, a wood cut after Albert Durer, which had been smeared with a dark yellow colour, was completely restored to its original whiteness.

Writing ink may be readily discharged by ozone, especially if the paper be subsequently treated with very dilute hydrochloric acid, to remove the oxide of iron.

Printing ink is not attacked by ozone to any appreciable extent, unless the action be long continued. Vegetable colouring matters are completely removed by it; but metallic colouring matters, grease spots, and stains produced by fungi, cannot be obliterated.

As applied in the small way, the method consists in placing a bit of phosphorus about three inches in length, and half-an-inch in diameter, the surface of which has been scraped bright, in a wide necked glass carboy, or other large hollow vessel, pouring about as much water, at about 86° F., as will half cover the phosphorus, closing the vessel with a cork, and allowing the whole to stand until the jar is charged as strongly as possible with ozone, which usually occurs after 12 or 18 hours. Then, without removing the phosphorus or the water, the paper intended to be bleached, previously moistened with water, rolled up, and suitably attached to a platinum wire, is hung in the middle of the vessel. The cork is then replaced, and the apparatus is left to itself. The roll of paper is soon surrounded with the fumes arising from the phosphorus, and the stains gradually disappear. The rapidity of the operation of course depends upon the nature of the substance to be discharged—three days being the longest time required in any of the experiments. Prints which had merely become brown by age, and others stained with coffee, usually became perfectly white and clean in the course of 48 hours. The action of the ozone, however, must not be continued too long, lest some of the finer lines of the engraving should be injured. After all the spots have disappeared, the paper is strongly acid, and if allowed to dry when in this condition, would become exceedingly brittle, and also dark coloured. It is consequently necessary to remove the acid completely. In order to accomplish this, the paper is placed in water, which is frequently renewed, and allowed to lie there until a bit of blue litmus paper pressed against it is no longer reddened. The paper is then passed through water, to which a few drops of solution of soda have been added, and is spread upon a glass plate. this is slightly inclined, and a fine stream of water is allowed to flow over the paper during 24 hours. After the paper, upon exposure to the air, has become dry enough to be removed from the glass without risk of tearing, it is taken off. and pressed dry between folds of bibulous paper.

Proceedings of Societies.

South London Photographic Society.

The ordinary monthly meeting of this Society was held on the evening of Thursday, the 14th inst., at St. Peter's School-room, Walworth-road. The Rev. F. F. Statham, M.A., F.G.S., in the chair.

After the usual routine proceedings, the Secretary announced that the next meeting would be made special, to take into consideration a question of considerable importance.

Mr. Wall, the honorary secretary, then said:—I have to inform the members that the memorial addressed by this Society to Her Majesty's Commissioners for the Great International Exhibition was duly forwarded, and its receipt politely acknowledged. But although a circular has been addressed by the Commissioners to the secretaries of the sub-committees detailing the various applications for space, and urging such investigations as may tend "to do credit to the present state of national and local industry," photography is as yet unrepresented. It is true that the Commissioners have promised, since the receipt of this Society's memorial, that such a committee shall be appointed; but this promise is not yet fulfilled, and precious time is, consequently, being lost. Of all classes of exhibitors few need more time for the preparation of their various works than photographers, especially when such preparations must be made at the worst possible time of the year. It is, therefore, important, both to the interests of the art and the interest of its professors, that any investigations which may be necessary, should be promptly made; and such decisions as may be arrived at, quickly published; in order that British photography may do honour to the national character.

By way of hint to such of our professional photographers as may have greater respect for individual profit as opposed, in their thinking, to national gain, I may, perhaps, venture to point out to them, that so surely as the prejudice against English as opposed to foreign photography (which already shows signs of existence) is proved by next years great show, to be but too well founded, so surely will the encouragement and patronage which photography has met with in this country be, to a very serious and damaging extent, taken from them and bestowed upon their Continental brethren. While, on the other hand, if this country carries off the palm of photographic excellence, *we* shall gain crowds of patrons from other lands, and our art thus encouraged must necessarily march more rapidly upwards and onwards to perfection. We cannot, I think, whether as a society, or as mere individual lovers of our art, too frequently urge upon the photographic world the vital consequence of preparing *earnestly* and *thoroughly* for that glorious contest of nations of which this country will next year be the theatre.

Holding such opinions as I have ventured to refer to, then, your Committee, at our last meeting laid before you the memorial you so unanimously adopted, fondly hoping that their active energy and promptitude would find the most hearty welcome and appreciation in every section of what the *Daily Telegraph*, in respectfully naming this Society, calls "the great modern guild." I have no reason to believe this is not the case, but the editor of our late organ, *The British Journal of Photography*, strangely misconceiving the spirit and purpose of our memorial, has not only protested against it as an individual member of this Society, but denounced it as illegal, and satirized it to the best of his ability in the leaded type of a leading article.

Mr. Shadbolt holds that "such a document could not be adopted as that of this Society without previous notice of so important a measure being contemplated." Now, whether judged by our own laws, or by precedent and custom, I hold that the course we adopted cannot be questioned. If Mr. Shadbolt thinks otherwise, it is very easy to show cause for such a belief, until which is done little or nothing can be said in reply to this accusation.

With reference to the article in that gentleman's journal, it indicates chiefly that Mr. Shadbolt must have a very fertile imagination. Our memorial points out that a committee for the management of the photographic department is of vital consequence, and urges that such a committee be promptly organised. Surely no one will deny either the necessity for, or the non-existence of, such a committee. But our imaginative friend, the Editor, trembling with fear lest what he calls "a small, not to say a very small, suburban society" should prove a second Curtius, and leap into "the yawning gulf *supposed* to exist in the form of a vacant space where a committee for managing photographic affairs ought to be found," quite overlooked the fact that this Society, in its memorial to Her Majesty's Commissioners, never implied or intended that it should "sacrifice itself by leaping *bodily* into the void space." I trust, therefore, that this assertion will calm down the eager fears of our too susceptible censor, and convince him that there is no fear of this Society taking undue precedence of its elders, *unless they choose, by retreating, to leave their southern relative foremost in the van.* I trust, that as a society "established for the advancement of photographic art and science," we shall never be deterred by the fear of misrepresentation from taking any steps clearly and closely united with the duties we have voluntarily sought, and generously undertaken.

The Chairman thought that the Society deserved commendation and congratulation in the matter of the memorial, instead of condemnation, and would have been glad if the same action had been simultaneous throughout all the societies.

Mr. G. Wharton Simpson then read a paper "On Mounting Photographs." See p. 551.

At the conclusion of his paper, Mr. Simpson produced a portfolio of choice photographs, consisting chiefly of the productions of Mudd, Heath, Rejlander, Robinson, Lacy, and others, in illustration of different points in his, which were examined with much interest and admiration by the members.

The Chairman thought that proper attention to the shape, &c., in mounting, was analagous to the exercise of good taste in dress. An artist knew well, that however beautiful might be the person of the model he was about to paint, the result might be entirely spoiled by neglect in the colour and arrangement of drapery; and that the plainest person might, by the exercise of good taste in this respect, be made pleasing and attractive. He thought that Mr. Simpson, in the collection of pictures he had brought—the finest he (the chairman) had ever seen,—in some of the examples he had pointed out, had admirably illustrated this. Regarding the question of shape, he thought it was a pity that there was not some simple and efficient apparatus for cutting the various shapes of that graceful form, the oval, as he had been struck in the various ovals amongst the photographs shown, how few of them had the most graceful proportions. He thought that for many purposes, a kind of paper or card which he had seen, made semi-transparent, and very like horn, might be cut into shapes as guides, more readily than glass. He wished that Mr. Simpson had given a hint or two as to the best remedy for bad mounting, as well as the best means of securing good. He should like to know what were the best means of removing a badly mounted print from the card.

Mr. Simpson said the simplest method of removing a mounted print from the card, was to soak it until the paste or glue were thoroughly softened again. The best way to effect this was to take one or two thicknesses of blotting paper, and after saturating them with water, lay them on the surface of the print for half an hour or an hour. This would generally allow the print to be removed without difficulty. Sometimes a longer time might be required, and sometimes possibly the aid of warm water; but most adhesive materials would eventually yield to continued treatment.

Mr. Howard said he was in the habit of using dextrine for mounting. He had used starch, but found that from the large quantity of moisture it contained, and the consequent expansion of the print, there was always considerable warping and cockling. Dextrine, on the other hand was so very sticky or adhesive with the addition of a very small amount of water, that he found very little difficulty from cockling when it was used. He had found that when the prints had curled, they might be straightened by a very simple process. He just laid the print, face down, on a piece of plate glass, and rubbed it with the ring, or handle of a key, which quickly made it quite flat.

Mr. Wall said that an agate burnisher was the best tool for such a purpose, and was very efficient.

Mr. Valentine Blanchard, referring to the allusion to music, said it must be obvious to every one that a succession of straight or parallel lines would be offensive to the eye, as consecutive thirds or fifths were to the ear. Regarding the question of removing prints from the card, he had found it almost an impossibility, where starch had been used for mounting them. He had soaked a print twelve hours, and then found it tore off in pieces rather than lift entirely away. Referring to the trimming of the prints, he had found, that, contrary to what might perhaps have been expected, plate glass for cutting on did not dull the edge of the knife. He used a knife something like a strong lancet, and found he could cut a hundred pictures without needing to sharpen the knife. On glass too the cut was so clean, leaving no ragged edges. In mounting card pictures he always damped the cards, doing it in a very simple manner. About fifty of the cards were taken by one end, and the other end fanned out by passing the fingers rapidly over, allowing them to pass through the water at the same time. This was the method employed by letter-press printers to damp cards for printing on.

Mr. Wall confirmed Mr. Blanchard's remarks as to the difficulty of removing prints mounted with starch.

Mr. Sebastian Davis had found gelatine the best substance for mounting. He first soaked it for a few minutes in a little water, and then added water at about 200°, which dissolved it into a consistency pleasant for use. He found also that prints mounted so, or with any form of glue, were very easily removed by holding them a few minutes over the steam of boiling water.

Mr. Simpson said that meta-gelatine had been recommended by some for mounting; but he thought its use was not advisable.

The CHAIRMAN said that perhaps where it was found difficult to remove a print from a mount, it might be possible to reverse the operation and remove the mount from the print, referring, in illustration, to a method of transferring engravings to wood, which used to be much practised.

Mr. SIMPSON said that although it might raise a smile to say that the mount might be removed from the print, when the print could not be removed from the mount, it was nevertheless an important practical suggestion. If after soaking well there was danger of tearing the print in removing, the best plan was to lay it down, face undermost, and gently rub away, or tear away, the card in small pieces. This might be done without injuring the print, when otherwise, lifting it, it would have dropped to pieces from the long soaking necessary to soften the adhesive material.

The CHAIRMAN asked if when starch was used the prints would be apt to discolour from iodine, in the presence of sea air.

Mr. SIMPSON said the small amount of starch, and the mode in which it was insulated, would be a sufficient protection. Moreover, starch was used in all the German papers so largely used by photographers, as the sizing material, and if the amount of iodine fell in the atmosphere at the seaside, would affect the one it would the other.

Mr. MARTIN remarked that in order to produce the blue tint on starch it was a necessary condition that the iodine be free and not in combination. The iodine present in the moisture of the atmosphere at the sea-side would generally exist as iodide of sodium. Regarding the removal of prints mounted with starch, perhaps the simplest plan would be to convert the starch into dextrine, which was very easily effected by the aid of acids. If the picture were soaked for a short time in a weak solution of oxalic acid, that would convert the starch into dextrine, which was easily soluble, and the print might readily be removed.

Mr. HOWARD asked what effect that would have on the prints themselves?

Mr. HUGHES said that long soaking alone sometimes made the print so rotten that it was useless when it was unmounted, he was afraid that the addition of acid would not much improve its condition in that respect. Regarding the subject generally, he felt sure that every gentleman present must have been as much interested as himself in the variety of practical hints, so amply illustrated by such a selection of beautiful prints. An opportunity rarely occurred of inspecting such a collection, and he thought he had never heard a paper that was accompanied with such fine illustrations of its various positions, and to persons resident in the country, where the facilities did not exist for getting such things done readily by a professional mounter, the suggestions must be invaluable. Regarding the means of shaping, he felt there was a considerable want, the means of supplying which must, he thought, find a way into commerce soon. He referred to glass guides of a variety of shapes and sizes, to aid the cutting of photographs. The question of proportion of margin was one which would necessarily be regulated very much by individual taste, and also by the purpose for which the pictures were required, and how they were to be kept. For small pictures he was especially fond of great amplitude of margin. One of those exhibited by Mr. Simpson, a child's head, the picture was little more than a ninth size, mounted on a good sized card, which to his taste was charming [the card was 11 by 8, with an india-tint, 5 by 4]. Regarding the material to be used, in that instance, again, the amount of work to be done, and the facilities for doing it would influence the selection largely. He thought that the question might safely be narrowed into one of starch or glue. Starch had many advantages; it was so easily made, and so clean. The difficulty with it was cockling. Glue, on the other hand, largely removed that difficulty. He thought it was always worth while to take a hint from those who did the work professionally, and as Mr. Simpson had just told them, glue was chiefly used by professional mounters. The use of india-rubber had frequently been tried; but, except for scrap-books, it could not, unfortunately, be made available. When used thick it was unmanagable, and when thin it soaked into the print; for attaching prints into scrap-books however, nothing could exceeds its value. A touch at each corner held the print quite flat; there was no cockling; and it could be removed in a moment, without the slightest injury to either the print or book. Mr. Simpson's paper has been so exhaustive, that it really left very little for any one else to say on the subject. He had been in the habit of thinking lately that the entire field of photographic subjects had come under the attention of societies. Here, however, was one of the greatest interest and the utmost importance, which, until to night, had been comparitively untouched, and would furnish material for much subsequent consideration.

Mr. SIMPSON then called the attention of members to several sizes of mounts, with an india-paper tint, stating in answer to several questions, that he had procured them of Mr. Fox, of Little Britain; the prices ranging from two shillings a dozen, upwards. They appeared to him very little more than those without an india tint.

After some further conversation, it was announced that the Experimental Committee would meet at the house of Mr. Hughes, 379, Oxford St., on the last Tuesday evening in November.

Mr. Wormold was unanimously elected a member of the society.

After the usual votes of thanks the proceedings terminated.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE first meeting after the recess was held on the 12th. W. SCOTT ELLIOT, Esq., in the chair.

The minutes of a previous meeting having been read and confirmed, J. Scarth, Esq., A. B. Fleming, Esq., and the Rev. D. J. K. Drummond were ballotted for, and elected as ordinary members of the society.

Mr. T. B. JOHNSTON called the attention of the meeting to an unwarrantable attempt on the part of Lord Abercromby to prevent him placing his camera by the side of a public road, to take a view. His lordship had first objected in person, on the score of danger, the sight of the apparatus having a tendency, he asserted, to excite shying horses. Mr. Johnston having declined to acknowledge his lordship's right to interfere, was next visited by a constable and two other men, who had Lord Abercromby's instructions to order him off. Mr. Johnstom intimated that he would not leave until he was ready, for Lord Abercromby or any one else, and sending his card to his lordship, continued his operations without further interruption.

On the conclusion of Mr. Johnston's remarks, Mr. George Harvey, R.S.A., Sheriff Hallard, and others, expressed their opinions on the very uncalled-for interference which had been attempted, and their satisfaction that it had been so properly resisted. Their observations was fully concurred in by the meeting.

Mr. WALKER, at the request of the Secretary, then gave a description of Mr. Sutton's Panoramic Lens and Camera. Unfortunately, the specimen prints which should have accompanied the camera had not come to hand; but Mr. Walker and other members of the society, who had seen pictures taken by it, bore testimony to their great beauty.

The meeting, as usual on the first evening of the session, concluded with a conversazione. Among other interesting specimens on the table were several prints in photo-lithography, by Mr. Ramage, of Edinburgh, exhibited by Mr. C. Sinclair. The particular process employed was not communicated; but it is expected that the details will be furnished at a subsequent meeting. The specimens exhibited attracted considerable attention.

REGULATIONS OF THE SIXTH ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The Sixth Annual Exhibition of the Society will be opened about the middle of December, and will continue open about two months. All descriptions of photographs will be admissible. It is strongly recommended that each picture should be framed and glazed, with a margin of mounting board not exceeding 2½ inches in width. It is also recommended that, in the case of pictures smaller than 9 by 7 inches, four should be in one frame; but no frame must exceed 12 square feet in area.

Each picture must have written distinctly on the back, the name of the subject, the artist and owner, the process (calotype, waxed paper, the different varieties of the collodion process, &c.), and, if for sale, the price. Exhibitors are requested to be careful in specifying the particular process by which their pictures are taken, in order that it may be inserted in the catalogue.

The Society propose to award their silver medal for

The best Portrait or Group.

The best frame containing Six Cartes de Visite; and

The best Photograph of any other kind.

A commission of 10 per cent. will be charged on all sales made during the exhibition.

Works intended for exhibition must be delivered, carriage paid, at the Rooms, No. 90, George Street, Edinburgh, on 30th November next, after which none can be received. A list of the photographs sent must be enclosed in the case, and a duplicate list forwarded by post to the Honorary Secretary. At the close of the Exhibition the pictures will be carefully packed and returned, carriage paid, to the owners.

A. F. Adam, *Hon. Sec.*

9, *South Charlotte Street, Edinburgh, October*, 1861.

Photographic Notes and Queries.

Splitting of the Film.

Sir,—Alkaline hypo, as you suggest, is, I have no doubt, the cause of a "Perplexed Amateur's" difficulty.

A fortnight since I developed *three* collodio-albumen plates; *two* of them, when the development was completed, I placed in a new solution of hypo, the film split into thousands of pieces; I directly dropped a few drops of acetic acid into the dish, and placed the third negative therein, it remained quite sound.

If a "Perplexed Amateur" will test his hypo he will find it alkaline; if he will make it distinctly acid I think his "perplexities" will not trouble him again. I am indebted for the caution — always to acidify a fresh batch of hyposulphite of soda—to Mr. Wardley, of this city.—I am, sir, yours respectfully,

Edwyn Offer.

Manchester, November, 18*th*, 1861.

Dear Sir,—A "Perplexed Amateur" has apparently neglected a precaution requisite in all dry processes, without the plates are gelatinized—that is to gum the edges of the plates. A ready method of doing this, is to lay the plate on a flat surface, and place a straight edge of wood as a guide, and rub the surface to be used for about the one-eighth of an inch all round with a piece of whetstone. By doing this, if the operations are otherwise carefully performed, I am much mistaken if he will not find his troubles at an end on this score; that is, with the proviso that he uses a fitting collodion, the one last-named being simply iodized, needs the addition of a bromide. It should not give a blue opalescent film, but be sufficiently iodized for the film to be thoroughly creamy. Some collodions I have found, although otherwise suitable, had so much alcohol in excess, as to have very little adhesive properties.

Another precaution is, that after the plates are cleaned, they should be well dried at a high temperature. My plan is, to put them in a metal plate box covered over with paper, and placed in the oven of the kitchen-range for a time; let them cool, and use them at once; but previous to coating, rub them over by means of a bit of cotton-wool, with a few drops of old red collodion, finally polish with a chamois.

For Fothergill plates, I have never found this plan fail, but it is not sufficient for the tannin, if the plates are ungelatinized. I have saved some of them from destruction by running a narrow band of spirit-varnish round dry plates previous to soaking. Some operators immerse the plate in the hypo when fixing; a rife cause of loosening the film, from the great specific gravity of the hypo causing it to insinuate itself between the film and the glass.

As a last resource, flooding the plate (after fixing and washing off the fixer) with glycerine and water, equal parts, is often efficacious. There must be some amount of washing after the glycerine, or the plate will not dry.

If all this is insufficient, his case is past prescribing for; although I hope he will state the results.—I am, yours obediently,

M. Willett.

Bristol, Nov. 18*th*, 1861.

Dear Sir,—"A Perplexed Amateur" will find by using one part white of an egg, and *not* more than *two* parts water with ammonia, instead of *one* and *ten*, and flushing it off with *nearly boiling* instead of cold water, he will not be liable to the annoyance he complains of, unless his materials are very unsuitable for dry purposes; and even should this be the case, he may very effectually prevent the film from splitting up and pealing off, by coating *after* fixing, and well washing with a more or less strong "prepared albumen;" if a very desperate case, even the full strength may be used, but generally, much more dilute is sufficient as recommended in my pamphlet. When quite dry, varnish as usual; the albumen will help to strengthen and improve the coating of varnish.

A very strong hypo solution favours the splitting up of film, and plates that have been several times used are more liable to it than fresh ones.—Faithfully, yours,

Alfred Keene.

Sir,—The queries of a "Perplexed Amateur," in your last number, attracted my attention, from the circumstance that about two years since, while using one of the collodions named by him, I was troubled with a similar difficulty. I was using the wet process, the weather being hot at the time, I at first blamed the heat and attribute my difficulty to rapid evaporation of the ether. I soon, however, became satisfied that some other cause was at work; after trying various remedies, I at length applied to the maker of the collodion, but he could not suggest the cause, merely stating that the weather ought not to affect it, as it contained a full proportion of alcohol.

I was obliged to procure a new sample of collodion, when things went well again with me. Some time after, when reading a photographic periodical, I saw it stated that an excess of bromide exerted a mechanical effect on the film, causing it to split or tear: this caused me to think over the circumstances connected with my difficulty, and I remembered that on the occasion mentioned I was working a *new* silver bath, made according to a common formula, but one I never use, namely, by adding a certain quantity of iodide, to throw down iodide of silver, to be afterwards re-dissolved. Now I attribute my difficulty to the fact, that whilst using a *bromo*-iodized collodion, my bath was iodized only, which I believe induced this (mechanical?) action of the bromide; the bath not being very highly charged with iodide, and having no bromide in it, it immediately attacked the bromide in the film. I believe this to be the cause, because I never made a bath in that way before or since, and never met with the difficulty on any other occasion. My usual method of iodizing my bath is the one recommended by Mr. Hockin, viz., by adding a certain portion of collodion to the silver solution, and filtering out insoluble matter. I therefore conclude, that in making a bath, and iodizing by the addition of crystals of an iodide, a fraction of a bromide should be added also.

If you think these remarks worth a space in your valuable journal, they are at your service.—Yours respectfully,

E. E. L.

P.S.—Could ebonite be used for the dark slide and holders of cameras? It appears to possess the requisite qualities, and more so than wood.

[Our correspondent is scarcely logical. First assuming that an excess of bromide would induce a tendency in the film to tear, he then explains that in his case the film being robbed of its bromide by the bath, induced a similar tendency. We have used bromides in all proportions without any such result. For obvious reasons, however, the bath should be saturated with bromide as well as iodide where a bromo-iodized collodion is used. Our own method is simply to place in the new bath a large plate coated with the collodion we use. We fear that ebonité would be scarcely sufficiently rigid for the purpose named; possibly it might be made so. We cannot tell how friction might affect it.—Ed.]

Dear Sir,—Allow me to make a few remarks, which I trust will enable your correspondent, "A Perplexed Amateur," to emerge from his difficulty. I have practised the dry process to a considerable degree, and have often had the mortification of beholding some of the most beautiful negatives "go to pot," in the manner which your correspondent described last week.

I would advise "A Perplexed Amateur" to discard the use of the *collodion*, which he has tried, and use, if possible, an old powdery one. The collodion with which I obtained the finest results, was a mixture of Mawson's, Thomas's, and Hardwich's collodions, together with some of my own making, which I found would not answer for the wet process. These collodions were all about a year old, and unfit for use with the wet process, but by the dry, some of the finest results were obtained.

Regarding the *bath*, I think if "A Perplexed Amateur" gives satisfactory results with wet collodion, there is no fear, if kept in the condition in which it now is, of giving good results by dry. I found out that the greatest cause of the film cracking and peeling off, is *dirty* plates. The necessity of having the glasses *perfectly clean* and dry, cannot be too strongly urged, for I am fully persuaded that if the glasses *are* clean in reality, there need be no peeling off of the film. I have many times spent ten minutes in polishing a plate, and then the glass should be slightly warmed, either before the fire, or by the plan recommended by Mr. Howard, in his paper on the Fothergill process, published in the News some time ago. The film, when drying, contracts, and of course adheres to the plate more firmly in the places where it is most highly polished, and in the parts where it has not been perfectly cleaned, it cannot adhere with sufficient tenacity, and, therefore, cracks and peels off. I have lately been using the wet process by iron development, and intensifying afterwards, when it often happens that the film peels off in the final drying, and if we view the back of the glass by reflected light, we observe that where the film has cracked there is a bright silvery patch, caused by that part being imperfectly clean. Pardon my dwelling so long upon this part of the subject, but I am persuaded that the cleaner the glasses are, the number of cracked and peeled off films will be less.

I think the method of pouring the albumen on to the plate instead of using a bath is best. The proportion of ammonia appears to be very small. I generally use twenty drops to the ounce, whereas your correspondent only uses forty drops to ten ounces of albumen.

In conclusion, if your correspondent uses a suitable collodion, plates *perfectly* clean, and allows the film to set well before immersion, I think he will eventually get rid of his nuisance.—Yours obediently, TEESDALE.

Talk in the Studio.

Photography in a Court of Law.—The Civil Tribunal of the Seine recently decided a case in which M. Edmond, a gentleman of property, was plaintiff, and Disderi and Co., the well known Paris photographers, the defendants. M. Edmond had employed the defendants to take photographs of himself in his barouche with a groom standing at his horse's head, and had paid 100 francs for ten proofs, with the express condition that no other copies should be taken as he did not wish to be exhibited in shop windows or elsewhere. Having ascertained, however, that the defendants sold his photographs to the trade, and that the likenesses were exposed for sale in many establishments, he applied to the tribunal for authority to seize the said photographs wherever he might find them, and for an order to compel the defendants to destroy the negative from which they were printed. As MM. Disderi did not appear to oppose the application, the tribunal at once granted the authority.

Developing without Free Nitrate.—A correspondent referring to our recent paper on this subject says:—"I developed a plate to-day with Mr. Wardley's plan, and was greatly pleased with the results, it is quite a 'lift' for dry-plate photography, and I should imagine useful in wet in certain cases, for instance, in instantaneous views, for it gives the extremity of detail, minus intensity, and then the uniform starting point for thickening the image, will, it seems to me, produce better effects than have hitherto been obtained in this class of pictures."

Award of Medals.—The following award of medals was made at the close of the Photographic Exhibition in connection with the Birmingham Society:—

Silver ...	Portrait	Claudet
Bronze ...	Group	Robinson
Silver ...	Landscape	Bedford
Bronze ...	Landscape	Heath Mudd
Silver ...	Solar, *untouched* ...	Angel, Exeter
Bronze ...	Solar, coloured ...	John Turner Stafford Street, Birmingham

The judges recommended the society to give an *extra bronze* medal to Mr. C. Breese, for his stereographs, and Sir Francis E. Scott generously awards an extra prize to Mr. Rejlander for his works generally, but more especially for the likeness of a little girl (which he exchanged for the one of Prince Albert, which was withdrawn shortly after the exhibition opened), and which was of course too late for competition

To Correspondents.

A.B.C.—On adding the oxide of silver to neutralise a bath, agitation and time are required to produce the effect. If all the oxide you have added be taken up, and the bath is still acid, a further addition is necessary. 2. A twenty-grain solution of iron is generally strong enough for positives, but the strength will be largely governed by the proportion of acid added. In winter the quantity of acid may be considerably reduced. 3. Various strengths of solution, from 5 grains to 50, are used for negative development, with good results. Next week we shall have an article on the subject. During extremely cold weather it is advisable, if possible, to keep the temperature of all solutions up to about 60° Fah. 4. We have not tried the collodion to which you refer, but see no reason why it should not answer for negatives with iron development.

Photo-in-Distress.—Send us a print from a negative, with this irregular granular reduction, and we shall be better able to judge of the cause, and suggest a remedy.

J. T.—The largest size in which we have seen the ebonite baths is 16½ by 12½, the price of which would probably be seventeen or eighteen shillings. Messrs. Silver & Co. will, however, give you the best and most certain information on the subject of size and price. 2. Your question regarding single or double lenses and their prices is not sufficiently explicit. Please put it in a definite form, stating the purpose for which the lens is required.

John Carrol.—We can only suggest that you have not used sufficient heat. A very high temperature is necessary to make copper melt, a full white heat being needed.

An Experimentalist.—Caustic potash is the material recommended by Mr. Hardwich, for cleansing cotton wool prior to its conversion into pyroxyline. The proportions are unimportant; a dilute solution will answer. A common saucepan, if quite clean, may be used for boiling it in. The liquor potassæ of the P. L., usually sold by chemists, contains about 5 per cent. of potash. We have never used the lenses to which you refer, but believe they are pretty good of their class.

J. C.—We do not know certainly of any house which supplies the apparatus with water bath for waxing paper, nor the price; but will make enquiry.

Regnaty.—An old collodion, containing free iodine, is generally best for copying engravings. A portrait lens stopped down, or the triple achromatic lens, will answer best. If a very much reduced copy be required, the full aperture may be used 2. The amount of exposure will be entirely regulated by the condition of the chemicals, the strength of the light, and the aperture and focus of the lens used. 3. Develop with a weak iron solution, with excess of acetic acid, and intensify after fixing, either with bichloride of mercury, or iodine, followed by pyro and silver. 4. Tone with gold and acetate of soda.

N.—The large prints to which you refer, those of M. Alophe, are, we understand, very fine; but they are very much worked up. The touching is, however, done so skillfully as to defy detection almost. Pictures of life-size, or anything near it, if taken direct, must be exaggerated and coarse. To get any approach to delicacy a lens of very long focus, say 60 inches, must be used. In that case, to secure working in anything like the usual time, the full aperture of a lens of 12 inches diameter would be necessary. These are rough suggestions to show how impossible are the conditions on which delicacy depend, when life-size portraits are taken direct. The papers were forwarded to the address indicated.

I. P. E. is thanked for his communication, part of which will be used. We have not yet had time to examine fully the merits of the self-levelling developing stand, but will do so and report shortly. We cannot tell you the fees required for lessons by different photographers; they of course vary. Our own time is at present too fully occupied for tuition. Mr. Dawson, of King's College, is a very able photographer. Apply to him.

An Artist is informed by I. P. E that he can procure the sheet gutta percha he requires, of most respectable chemists.

Black Albumenized Paper.—I. P. E. suggests that paper well blackened with Japan ink, and then albumenized, would answer the purpose of a recent correspondent.

John Martin.—You will find several formulæ for intensifying in the Photographic News Almanac for 1862, which you will receive as soon as it is published. 2. The pistolgraph is altogether unsuited for stereoscopic pictures. The instantaneous stereo lenses of the maker you name are best suited to the purpose. Enlarging from a negative taken on a 1-inch plate up to stereo size would be sad waste of time, and yield a very doubtful result. The last-mentioned firm are not makers of lenses, but dealers. Their stereo lenses may be good of their kind, but certainly not equal to those we have just referred to.

M. B. L.—See a paper and discussion in this week's number on mounting photographs.

F. L. G.—A bath for dry plates should have a little acetic acid added, in preference to nitric acid. 2. Flatted crown glass has generally one side better than the other, which may be easily ascertained on examination.

Ponting.—The small quantity of a bromide which is generally used in a collodion, renders it a matter of comparatively little importance what base is used. Bromide of potassium is very insoluble, and therefore inconvenient. The bromides of cadmium and ammonium are most soluble, and therefore most convenient. If there be, however, already excess of cadmium in the collodion, and any consequent tendency to a thick or gelatinous condition, it is not advisable to use the bromide of that base, as that of ammonium will answer every purpose.

T. A.—We will write shortly, and try to expedite matters.

Teesdale.—We shall be obliged to you for the specimens and paper to which you refer. When a process is vouched by specimens it is always valuable.

W. Bartholomew.—The specimens by Mr. Wyatt which you forwarded are very fine indeed; delicate, brilliant, and artistic. The lighting generally is very good, in some cases a very little extra amount of shadow on one side might be an improvement, but there is nothing to find fault with. A little attention to position on the plate, as suggested in an article on mounting in the present number, might be an improvement. Let Mr. Wyatt try the acetate of soda with his toning bath, and be content to tone slowly. That will largely remedy the slight mealiness (it is not *measles*). We are gratified to find such an ample confirmation of the opinion we have more than once expressed of the lens in question. Nothing could be sharper or better defined than these. The pattern on the carpet would be better if less defined.

Some Critical Notices and other articles, as well as several correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 169.—*November* 29, 1861.

IN MEMORIAM.

It is with no ordinary feelings of regret that we announce the death of Mr. W. G. Lacy, of Ryde. The victim for many months, unconsciously, of an incurable malady, which he regarded as but the debility consequent upon over-exertion, he came up to London a few weeks ago, at the termination of a season unusually exacting in its demands upon his labours, for rest and medical advice; his symptons, which had remained in abeyance during the excitement of actual duties, rapidly assumed a serious aspect, and terminated in death on the night of Thursday, the 21st instant.

In him the photographic world has lost one of its ablest artists. During a comparatively short professional career he rapidly rose into the first ranks, where he found few to equal, none to surpass him in his speciality—portraiture. Not more than five years ago, he was entirely unacquainted with photography, and was engaged at that time in producing crayon portraits. The capabilities of photography being brought under his attention, he at once devoted himself heart and soul to its study and practice, especially regarding it as a means of artistic expression. He soon addressed himself to the professional practice of the art, and pursued it with an unobtrusive ardour which steadily secured both artistic and commercial success. His first efforts were confined to the production of glass positives. About three years ago, a collodion portrait of a child was brought under our attention, as the production of an unknown provincial photographer. Its high artistic merit at once arrested our attention, and we procured leave to copy it. The pose, arrangement, and expression, all marked the work of no common mind. We have since learnt from himself that the picture was his: any merit it possessed he modestly attributed to the model, a sweet little girl he had seen in the street, and at once exclaimed to himself, "That surely is the embodiment of the principal figure in Millais' 'Autumn Leaves.'" He obtained permission from her parents to produce a portrait of the youthful model, and we saw one of the results.

Vignette portraiture, with the productions of Mr. T. R. Williams as his standard of excellence, next engaged his attention, and these he produced with a perfection scarcely if at all, inferior to those of the master whose works were his ideal. It was, however, in album portraits, or *cartes de visite*, his especial superiority lay. There we consider him unrivalled. The exquisite delicacy of definition and texture, the perfect balance of lines, and of chiaroscura, the ever-varying, and always graceful arrangement of pose and accessories, the admirable and characteristic grouping which his card pictures present, all combine to render them the finest studies of composition which we have ever had the satisfaction of seeing in photographic portraiture.

About twelve months ago his album portraits first came under our notice, and from their uncommon merits attracted our attention. In answer to our inquiries he readily explained his method of working, an account of which we published in an early number of the present volume. Much of the beauty and delicacy of his pictures he attributed to the process he used. We have, however, always attributed it more to the fine taste, and artistic skill of the man; an exquisite perception of the effect of light on his model; a fine appreciation of the pictorial effect to be produced by actual objects; an almost intuitive sense of the amount of pictorial gradation, which every stage of development would give, were amongst his distinguishing characteristics. Since our introduction to him twelve months ago, we have had abundant opportunities of examining his productions, of seeing him operate, and tracing consequences to causes, and we speak with confidence of the sources of success.

Since our readers have been familiar with his name, his success in achieving connection and position has been as complete as it has been in an artistic sense. Commissions from the *élite* of society both in position and taste, have crowded upon him. The patronage and highest expressions of the approval of royalty at home and abroad, have crowned his efforts. The last portraits he took were those of the Grand Duke and Grand Duchess of Russia and the Princess Olga. He dies, alas, when he has attained the topmost pinnacle of success.

Such success is not attained without commensurate effort. Our departed friend was an earnest art student, and an indefatigable searcher after all knowledge which could advance him in the pursuit of his favourite art. With opportunities more limited than many, he had acquired a highly cultivated mind. No effort was spared to acquire the most perfect knowledge and the highest skill: no expense was spared to secure the most perfect appliances. In answer to a question we put regarding a toning formula for which he had recently paid £20 to a French artist, when we enquired was it worth it, he answered, "In aiming at perfection a very slight step is a great deal, and is worth anything." Such an answer was a key to his success. The slightest step was regarded as worth the greatest effort. There is alas, another point of view from which to regard his efforts, which, we fear, overtasked nature, and aided, if they did not cause, his death at the age of thirty-three. We cannot moralise, however, with our friend scarcely yet coffined. Our readers will bear with us if our own familiarity with skill and worth only just beginning to attract public attention, has induced us to extend this notice beyond a brief obituary paragraph. Those who have seen his productions will readily enter into all we have said.

PHOTOGRAPHY ON WAXED PAPER.*

Development.

In the preceding operations dishes of gutta percha may be used, but for the following we must adopt those of glass or porcelain.

For each sheet measuring 45 by 55 centimetres (18×22 inches), take a litre (35¼ fluid ounces) of saturated solution of gallic acid to which, at the moment of employing it, add 150 grains of solution of aceto-nitrate of silver, which has not been employed for sensitizing. The side of the paper which has been exposed to the light is placed downwards on the bath of this solution, taking care to avoid the formation of air-bubbles, and then completely immersed by the aid of a soft brush, which must be kept perfectly clean and used for no other purpose. The image, at first invisible, will appear in about five minutes; if the exposure has been well timed, the parts which should become black appear red, gradually becoming darker and darker until they are brown black; the half tones will begin to appear only when the shadows and dark portions are sufficiently intense.

If the exposure has been too long, the half tones will appear at the same time as the dark parts of the image, and appear so strong as to destroy all contrast; the darks will continue red and transparent even when nitrate of silver be added, and at last the whole picture will become darkened

* Continued from p. 554.

all over. If, on the contrary, the picture commences by appearing of a gray colour, it may be at once reckoned among the spoilt proofs; only the deepest shadows will come out, we may be sure that the exposure has been too short, or rather that the proof lacks excess of silver from not remaining long enough upon the silver bath, or in the latter being too weak. It sometimes happens that the paper turns brown in the gallic acid solution, and the image will scarcely appear; this is due to the bad quality of the paper and occurs only too frequently.

A good proof increases in strength very gradually, and remains stationary when all the silver of the gallic acid is deposited upon the paper. This affords facility for putting the proofs in the developing solution at night to find them finished in the morning. When a proof does not increase in strength we must add a little more nitrate solution, say 15 grains at a time, at intervals, not so quickly; for if the nitrate has not sufficient time allowed it to deposit itself upon the negative, it becomes precipitated, and thickens the solution of gallic acid, which then communicates a dirty yellow hue to the white paper. If one part of the picture is slower than the others in developing, or rather, if the distances are not black enough, which would cause the positives to be deficient in aërial perspective. The defect may be easily remedied by spreading a little aceto-nitrate of silver over the spot by means of a tuft of cotton wool, and then passing the gallic acid over it. The solution also becomes very thick when the negative has not been sufficiently exposed; for the silver not being sufficiently attracted to certain parts of the picture, is deposited over the whole surface, and is rendered opaque by a deposit of oxide of silver.

At the conclusion of the development, the gallic acid will always be found to assume a brown colour from excess of nitrate of silver no longer necessary to the formation of the image; the latter being completed, the paper is removed from the solution and then immersed in a dish filled with water. I prefer to make the negative more intense, than it is required to be finally to produce positives, and I watch for the moment when the image, viewed by reflected light, has lost its detail, and appears almost entirely black, while viewed as a transparency all the finish of a good drawing is visible. The negative will always appear more vigorous than it really is while impregnated with the brown gallic acid solution; in the washing bath, and when the back of the proof is rubbed with a tuft of cotton to remove the silver deposited there, especially when the development has continued a long time, the proof will soon begin to appear weaker, and it will lose more of its intensity in the succeeding operations—fixing in hypo, and the final waxing of the paper.

Fixing.

After the proofs have been left at least half an hour in water, twice renewed, they are dried between folds of blotting-paper, or suspended on a line covered with blotting-paper.

The proofs are now insensible to diffused light, but to render them permanent in a strong light and in sunshine, all the unchanged iodide of silver must be removed from the paper by means of a solution of hyposulphite of soda of the strength of part of this salt dissolved in three parts of rain or river water. Gutta percha dishes are preferable for hyposulphite of soda, which strongly acts upon the glaze of porcelain dishes, and dissolves the marine glue and varnish of glass dishes when constructed of pieces cemented together. Only one negative at a time must be put into the hypo solution, and left in it until its yellow colour has quite disappeared, and consequently the iodide of silver dissolved, which will require from half to three-quarters of an hour. The negative is then washed freely in abundance of water, and then placed in a vessel of water, frequently changed, for ten or twelve hours; it is then dried between sheets of blotting-paper. In this state the negative will remain permanent, but it will have lost its transparency, and appear granulated after being dried. To remedy these two defects, it will be necessary to revivify the wax by passing a warm flat-iron over the negative, or what is still better, re-waxing it. With turpentine waxed paper it is quite indispensable to give this last waxing, in order to protect the negative from spots while taking positives from them. If after this second waxing, which renders the proof transparent, any yellow spots of iodide of silver remain, the proof must be returned to the hypo bath and treated as before.

The sky in vigorous negatives is seldom sufficiently opaque to oppose the presence of light; in this case a wash of Indian ink may be applied.—(*Le Moniteur de la Photographie.*)

Scientific Gossip.

The preparation of pure materials for photographic purposes is a subject to which our readers are aware we have frequently called their attention. We have been induced to do this for the reason that more than three-fourths of the failures which have come under our notice (our own included, of which we have a most instructive number*), have been readily traced to a chemical impurity in some of the materials employed; and, moreover, it is our firm conviction that the future triumphs of photography will be gained far more by attention to the purity of the various chemicals used than by any mere manipulative excellence. The great stumbling block of photographers has been, and doubtless will be for a long time, until they are content to pay far more than its present price for it, the nitrate of silver which they use. Let those of our readers who are inclined to question our correctness, when we assure them that this salt has scarcely ever been obtained in a state of absolute purity, and that a manufacturer would scarcely be repaid for his time, expense, and trouble in making it, even were he to charge twenty shillings an ounce—let such read the difficulties which M. Stas had to overcome in the endeavours to obtain metallic silver fit for his experiments.

The first process which was tried was the reduction of chloride of silver to the metallic state. This is an operation which is not unfrequently performed by the photographer; but, unless important modifications are introduced into the processes usually adopted, it will be impossible to obtain the metal in a state of even approximate purity. All the processes hitherto made known for the reduction of chloride of silver yield a metal containing silicium, copper, and iron. In order to obtain it free from the last two metals it is necessary to pour the nitrate of silver, diluted with thirty times its weight of water, into a slight excess of pure hydrochloric acid, and then to wash the precipitate with cold distilled water. The chloride is afterwards to be dried at the ordinary temperature, and digested, after being finely powdered, in nitro-hydrochloric acid. When well washed after this treatment the chloride does not retain the slightest trace of either copper or iron, whilst so long as it remains in a curdy form it retains in its pores, like coagulated albumen, some of the bodies which were dissolved in the liquid from which it was precipitated. When, however, dried at the ordinary temperature and finely powdered, chloride of silver very easily yields to aqua regia the foreign metals with which it is contaminated. When thus purified the chloride of silver must not be reduced by Gay-Lussac's method (fusion with chalk and charcoal), or it will be certain to be contaminated with silicium. It must be mixed with its own weight of pure dry carbonate of soda, containing a tenth part of pure nitrate of potash, and heated in a crucible of white unglazed porcelain, a small portion being introduced at a time, and the heat carefully regulated to avoid the bubbling up of the mixture. A few precautions are necessary in reducing the silver in this way. The unglazed porcelain crucible must be placed inside a clay crucible, and the space between the two crucibles filled up with calcined pipe-clay, powdered and mixed with 5 per cent. of fused and powdered borax. Under the influence of heat the borax fuses and solders the whole

* "A good failure is often more instructive than success."—Faraday.

together. When the chloride of silver is reduced the whole can be handled, and the melted silver poured out as if from one crucible; the great bulk of material through which the heat has to pass before it reaches the porcelain crucible prevents any danger of loss of silver owing to the cracking of the former. After the chloride is reduced it must be re-fused with a tenth of its weight of pure nitre and borax, and then run into an ingot mould lined with pipeclay. In this manner bars of silver are obtained which contain scarcely appreciable traces of foreign matters.

Another plan of preparing metallic silver, which yields it of perhaps greater purity than the foregoing is one proposed by Baron Liebig. The process consists in reducing in the cold by means of pure milk sugar, a pure concentrated ammoniacal solution of nitrate of silver, to which pure potash has been added until fulminating silver begins to precipitate. After a short time a violet precipitate is formed, which is transformed into a mirror of silver if the solution does not contain more than 10 per cent. of nitrate. If on the contrary it contains much more metal, the violet precipitate of silver remains. This precipitate after being washed with water is digested in aqueous solution of ammonia, which removes all the copper, if the silver contained any. When dried, it preserves its violet colour, and evidently constitutes one of the peculiar states of silver referred to by Mr. Malone, during his lecture on the photographic image recently published in our columns. Heated to 300° or 350° C., the metal becomes incandescent, and then assumes its proper colour, being of a dead white. To reduce it into bars, it is fused with a certain quantity of pure nitre and borax, and run into the lined ingot mould as above mentioned.

One difficulty in these experiments was to know when the silver was really pure, as there existed no standard wherewith to compare the different specimens. After many trials, M. Stas at length succeeded in preparing some absolutely pure silver by the electrolysis of argento-cyanide of potassium; the deposit being made upon a surface of porcelain previously covered with a mirror of silver by Liebig's method. For the positive electrode coke was used, obtained by heating the vapour of naptha to redness. To obtain the nitrate of silver fit to prepare the cyanide from, some of the purest silver obtainable was dissolved in nitric acid, evaporated to dryness, and the salt fused. After cooling it was powdered and digested in cold water, care being taken, however, to leave some nitrate of silver in excess undissolved in order to prevent the oxide of copper from entering into solution. The liquid was then allowed to stand for three or four days, filtered through double filtering paper, then digested with an excess of oxide of silver, and allowed to remain at rest for a sufficient time. This solution was diluted with water until it only contained a thirtieth part of its weight of nitrate, and poured into pure aqueous hydrocyanic acid, until cyanide was no longer precipitated. The cyanide was shaken in the liquid to finely divide it, and then washed with water acidulated with nitric acid, and finally with pure water. It was then diffused through an amount of aqueous hydrocyanic acid equal to that used in its precipitation, and then pure ammonia or potash was added to the mixture till the precipitate was all dissolved. When undergoing electrolysis, the positive pole of carbon was surrounded by cyanide of silver contained in a little linen bag purified by washing in hydrochloric acid; in this way silver was returned to the liquid as fast as it was lost by electrolysation. M. Stas says, that he has been unable to find any foreign body in this silver after it has been fused in an unglazed porcelain crucible with a mixture of purified nitre and borax.

Another plan by which very pure silver may be obtained is, by making use of the reaction between finely divided phosphorus, and a 1-per cent. solution of nitrate of silver. This process is very slow, but the metal, after having remained for a long time in an excess of a solution of nitrate of silver, and then being digested in ammoniacal water, yields, after fusion with purified nitre and borax, *absolutely pure silver*. M. Stas states that by this reaction he prepared the first really pure silver that he ever possessed.

One of the most interesting results obtained in these experiments is the plan for ascertaining the purity of silver. When the metal is absolutely pure it will remain melted in the air at a sufficiently high temperature to volatilize it, without becoming covered with any scum or discolouration, and without giving a coloured vapour. Silver containing no more than the 1-500,000th part of iron, copper, or silicium, becomes coated with a very thick and mobile scum when it is fused before the air and gas blowpipe. Silver containing scarcely appreciable traces of copper, when volatilizing in an oxidizing flame, always gives a coloured vapour. This assay may be performed on charcoal or white burned pipe-clay, or on porcelain. The scoria derived from the impurities in the metal always forms upon the surface of the flattened spheroid resulting from the fusion. After cooling, the foreign matter is found adhering to the silver, near the point of contact of the metal with the support.

THE INFLUENCE OF HEAT ON THE BATH AND DEVELOPER.

BY J. C. LEAKE, JUN.

Sir,—I have recently conducted a few experiments with a view of ascertaining how far the sensitiveness of the film of bromo-iodide of silver is affected by temperature; and as at this period of the year the subject may possess some interest, I beg to submit to your readers an account of my experiments.

It seems to be accepted as a fact among photographers that a reduction of heat is followed, as a matter of course, by a diminution of sensitiveness, and *vice versa;* it is also said, "*All* chemical action is accelerated by heat." Now the following experiments tend to show that this statement must be taken with a reservation; but as I may have fallen into some error, they shall be detailed, and if some other experimentalist will repeat the operations and report the result, we may arrive at some satisfactory conclusion.

In all the experiments, a bromo-iodized collodion, made on Hardwich's formula, was used, and a bath containing forty grains of nitrate of silver to the ounce, with two drops of nitric acid, to twenty ounces of solution.

For the first experiment, the bath was placed in the open air during the recent frost, till the temperature was reduced to about thirty-five degrees. A plate excited in this, was exposed in the camera twenty seconds. This was quite long enough and produced a fair picture; but the formation of the iodide of silver was very slow, (it was at least five minutes before the plate was fit for the camera) and the development though regular, was somewhat tardy.

The bath was now warmed up to fifty degrees. The iodide of silver then formed rapidly, and the film was ready for the camera in about three minutes. An exposure of fifteen seconds produced an impression much resembling that of the first experiments, but manifestly the other five seconds exposure would have been an improvement. In this case the development was more rapid, and the appearance of the image altogether more satisfactory.

On heating the bath to eighty degrees, the iodide was most rapidly formed, and the plate was ready for the camera in about two minutes. After an exposure of fifteen seconds, on application of the developer, the high lights started out instantly, but the half-tints held back for a longer period than before, and the plate was fogged to an extent which rendered it useless.

On cooling the bath to the ordinary temperature it again worked well, and appeared none the worse for the treatment it had received. In all these experiments an iron developer, forty grains to the ounce, had been employed, and had been used cold.

I now resolved to try the effect of heat in the developing process, the bath remaining at the temperature of the room (about sixty-five). A plate was excited, exposed twenty seconds, and developed with some of the same solution as before, but with the temperature reduced to about thirty-five degrees.

The development was very slow, the image was weak, and when fixed was covered with minute spangles of metallic silver, the whole effect being that of under exposure.

The solution was now warmed up to fifty degrees. A plate exposed the same time as the last, developed perfectly, with plenty of detail, fair intensity, and clear shadows. On raising the temperature to one hundred degrees the image started out instantly, but the half tints were not so perfect as in the former experiment, and the whole plate was slightly fogged. On repeating this experiment, I added a small additional quantity of acetic acid to the developing solution; this prevented the fogging, but I do not think any advantage resulted from raising the temperature above—say, seventy degrees. From the experiments above detailed, and many others not mentioned here, I am inclined to the belief that in the wet process the most harmonious pictures will be produced when all the solutions are at an even temperature of about sixty degrees, and that no increase of sensitiveness, or any other advantage will be gained by heating either bath, or developing solution, or both, above that point.

THE FOTHERGILL PROCESS; ITS PRACTICE IN TROPICAL AND TEMPERATE CLIMATES.

BY JOHN TAWSE, ESQ. OF MADRAS.*

The object of the writer is to adduce the photographic experience of several years in a tropical climate in support of the beautiful process known as "Fothergill's." The photographic art is now so widely practised in India and in the Colonies, that any reliable practical information on a really good dry process suited to those climates is of value, as saving much disappointment to tourists who may wish to bring from the scenes of their travel first-class photographic delineations of what most interested them. Many of the published processes for imparting keeping-qualities to collodion plates, however well they may be suited to the climate of England, are found to be insensitive and unmanageable in the red hazy glare of tropical light, besides being liable to faults inseparable from the chemical effects of excessive heat. On this account wet-collodion photography has hitherto been chiefly practised in the East, which necessitates either a dark tent for migratory work, or a cumbersome photographic van, for the preparation of the plates. Besides the many preservative agents known in this country, the writer has experimented with gum dammar, the juice of the sugar-cane (which contains a large per-centage of mucilage), tincture of opium, oxymel of squill, decoction of linseed, and many others, all of which are capable of exercising a certain preservative influence when in contact with iodine of silver on the collodion plate, but have all more or less the fault of producing stains in the development. In the case of the oxymel of squill—a compound totally different from the simple oxymel—the objects on a plate so under-exposed as to be of the positive character appeared in hues very much resembling the natural colours; the light green of the tamarind leaves was plainly perceptible: but the substance, as at present prepared, is valueless for photographic purposes on account of the stains it produces. The tincture of opium has also a very peculiar effect upon the collodion film; but in India this important drug is rarely to be procured uncontaminated with fusel oil, owing to the exclusive use of methylated spirit in its manufacture. An aqueous decoction of opium was unsuccessful from the large amount of adulteration in the Indian drug. The narcotine not being soluble in water, the full properties of opium as a preservative agent could not be availed of in this form. The preservative effects of the simple oxymel in the climate of India will be noticed hereafter.

The theory and manipulation of the Fothergill process, as practised in this country, are well understood. The immediate object of the writer is to detail practical differences in the mode of working and chemical action peculiar to operations conducted in a high temperature and in an atmosphere remarkable for hygrometric changes.

The electrical state of the atmosphere, as well as its condition with reference to its proportion of ozone, has been too much overlooked in the phenomena of the photographic action of light. It is highly probable that the latter agent plays a very important part in the chemical changes which are often so incomprehensible, when any known condition varies in the photographic art. It is well known that ozone affects the colour of strips of bibulous paper soaked in a solution of iodide of potassium and suspended in the open air. Iodine in this form is, in fact, a very delicate test for the presence of ozone in the atmosphere. Is it not probable therefore that its effects are also apparent, although not understood, in the iodide of silver in the collodion film?

The electrical state of the atmosphere in India has a marked effect upon certain chemical combinations. The casein of milk is precipitated when the atmosphere is highly charged. The writer has noticed these effects in a marked degree in the hot season of a tropical climate, and has known a severe thunder-storm to render useless a nitrate of silver bath which was previously in good order, and which, from the care taken of it, could not have suffered injury from ordinary chemical causes. These influences are supposed by the writer to affect the working of some of the dry processes in India—those at least which produce good results in this country, and fail in the East, even in practised hands. The modifications of the Fothergill process, hereafter described, are no doubt rendered necessary by similarly occult causes, quite apart from simple increase of temperature.

On Cameras and Lenses.—Before commencing the more immediate subject of these remarks, it may not be out of place to consider the description of camera suited to operations within the tropics; also the most correct and convenient form and size of lens for landscape work, which is, of course, all that the dry processes are adapted for. Photographic tourists in this country mostly prefer the portable camera, made with a folding-in flexible body, so as to admit of being packed in a very small space. For warm climates, however, the solid form, made of well-seasoned Spanish mahogany, is by far the most serviceable and satisfactory. To protect the focussing screen, the bottom part, upon which the inside body of the camera slides, should be made to fold up on hinges, by which means it becomes a solid box closed on all sides. When the bottom part is down for use it is supported by two sliding panels of mahogany, which draw in and out as required. A handle on the top of the camera completes its portability.

The bellows form of camera, besides being unsteady when exposed to wind, is very apt to become eaten by insects; and another serious objection to it is, that for landscape photography it is very difficult to preserve the slide or plate-holder in a position at right angles to the axes of the lens. In countries where labour is cheap and plentiful, the one is just as easily carried as the other, and the solid form, if well made of seasoned wood and brass-bound, will last with even hard usage for years. Rack-and-pinion work on the camera itself, for focussing, is more convenient with long-focus lenses than the handle and universal joint fitted on the lens-tube. The best form of stand is the common tripod with triangular top to permit of the camera moving in azimuth. If well and strongly made, these stands are remarkably steady even in windy weather.

The size of the lens must, of course, be suited to the description of work intended. For ordinary plates, viz. 10×8 or up to 12×14, a Ross's 4-inch view-lens gives fine results, as these sizes are considerably within its powers.

In dry processes where a long exposure is needed, a long-focus lens gives better half-tones than a lens of a shorter focus where the rays impinge upon the plate at a greater angle.

The orthographic and triplet lenses have not as yet found much favour in the East. Their chief advantage is the absence of distortion. But in working the above-sized plates with a Ross's 4-inch lens, the distortion is so small in an ordinary landscape that it is not perceptible, and for fine definition and rotundity nothing seems to equal it.

Gutta-percha baths should never be used in a tropical temperature.

Details of Manipulation.

The collodion best suited to the Fothergill process is one that gives a tolerably compact film—not too contractile, as in this case there is always a tendency to curling up and peeling off at the corners and edges of the plate. The iodizer should be in sufficient proportion to give a dense creamy film. A blue opaline film will not answer in any process where the surface

* From the *Photographic Journal.*

nitrate of silver is wholly or partially washed off. The collodion found to answer better than any other in high temperatures is that made expressly for this process by Mr. Keene, of Leamington. Next in quality comes Hockin's negative collodion in hermetically sealed tubes. The latter, however, has frequently been found ozonized, although carefully unpacked in the dark, in which state it still yields good pictures, although extremely insensitive to light. It is of the greatest importance in working with collodion in tropical countries, whether plain or iodized, never to expose it to the light, as the high temperature is peculiarly apt, in conjunction with light, to cause the ether to become acid, in which state the collodion discolours immediately on being iodized.

Whatever kind of collodion is used, better tones are always obtained by keeping it iodized for a few days before use. It is a mistake to suppose that in a high atmospheric temperature there is any difficulty in coating even large plates with collodion, owing to the rapid evaporation of the ether and alcohol. The writer has not found this to be the case, even with plates 18×24, at a temperature from 90° to 100° F. Some collodions become glutinous; but this is easily rectified by adding to each ounce 2 minims of pure chloroform.

Coat the plate in the usual manner, and allow the collodion to set firmly before dipping in the bath. Wash up and down as usual, and allow the full time of immersion, viz., two minutes with the thermometer between 75° and 95°, three minutes at 60° to 70°, four minutes at 60° and under. The iodide of silver will not be perfectly formed under two minutes, even at a temperature of 90°. This the writer has ascertained from numerous trials.

Wipe the back of the plate carefully with a piece of clean rag, on the removal of the plate from the bath, to remove drops, and also to give time for the surface to drain off its surplus nitrate of silver. Place the plate on a stand perfectly level, and pour carefully over it distilled water in proportion as under:—

16 drachms for a plate	... .	8 × 10
20 " "	... ...	12 × 15;

pour gently from a 2 oz. or 4 oz. phial, advancing the wave gradually until the right quantity of water is upon the plate. The stand should be placed in the middle of an ordinary developing dish. Take hold of the ends of this dish with both hands, and oscillate in such a manner as will cause the water to flow in a wave backwards and forwards without spilling (this is easily done with a little practice); continue this washing to equalize the bath solution on the surface of the plate for two minutes, then pour off and drain for a few seconds.

The albumen solution is made as follows:—

White of fresh eggs	6 oz.
Distilled water	6 oz. to 8 oz.
Chloride of ammonium	6 grains.

Shake in a large bottle until well frothed, and filter through blotting-paper.

Pour this solution carefully on the plate in the same manner as the water, wave backwards and forwards as before, and allow it to rest upon the film for four minutes, the object of this being to form a perfect layer of albuminate of silver combined with chloride. Pour off and drain freely. Then immerse the plate in a flat bath of distilled water, wash well in this so as to remove all the surplus albumen. The water should be deep, so as to flow freely over the surface of the plate. The plate is then to be reared up to dry spontaneously, resting on blotting-paper, and leaning against glass.

In the ordinary way of working, the plate is now complete for exposure; but in the East, or any country where there is a red hazy atmosphere from excessive heat, the clearness of development and intensity are greatly increased by pouring over the plate, after the last washing, a solution made as follows:—

Common Indian gall-nuts, commonly called Myrabolams, in powder ...	... 2 drachms,
Boiling distilled water	... 8 oz.;

filter, and use when cold.

The writer cannot explain the chemical action of the gall-nuts, except that they contain gallic acid, and probably tannin. It is sometimes difficult to obtain sufficient intensity in some states of a tropical atmosphere. The above solution is found to produce great intensity, combined with clear definition in the distance, and absence of solarization. The development is also much accelerated.

The developing solution for this process, with or without the above modification, is made as follows:—

Pyrogallic acid	10 grains
Distilled water	10 ounces
Glacial acetic acid	200 minims.
In a separate bottle, mix—	
Nitrate of silver	60 grains
Distilled water	2 ounces
Citric acid	10 grains

Dissolve.

The exposure in India, with a Ross's 4-inch landscape lens and ½-in. diaphragm, is from 8 to 12 minutes. The plate must not be under-exposed, but a little over; viz., from 3 to 5 minutes makes little difference, except that the development is more rapid and the shadows better defined.

Fothergill plates, prepared as above, are exceedingly hard and firm in the film, and cannot be injured by any amount of washing; neither has the film the least tendency to peel off the glass, if the edges are roughened in the usual manner.

To develop, first dip the plate in distilled water (the same as last used will do) so as to moisten the surface, then place it on a levelling stand, and pour over it the requisite quantity of pyrogallic solution to which has been added 15 or 20 drops of silver solution with citric acid. Wave backwards and forwards as before. The picture appears in a minute or two. The developer, as above made, never becomes turbid, and the development is clear and uniform. The combination of citric and acetic acid is better than using either alone. Care is required not to over-develop. The intensity should be judged of by the details of the picture, and not so much by the sky as is usually done. Wash well before fixing, and fix with hyposulphite, not cyanide. Dry and varnish as usual.

The plate will keep for many months, even during the rains and in damp situations.

If stains are encountered they are generally on the surface, and can be rubbed off with a piece of cotton. This is almost invariably the fault of the bath. For any dry process in a hot country the best form of bath is the simple solution of silver, saturated with the iodide as usual, without any alcohol or ether. With pure recrystallized silver, the writer has never either acidified or neutralized. A bath prepared as above is always in good order if kept in a dark place. The strength should never fall under 35 grains of silver to the ounce. It is better to fill up with a solution of 40 grains of silver in distilled water, without any iodide, as the bath in India has a tendency to become charged with an excess of iodide of silver in a reduced form—a condition which some have termed supersaturation. This is a fertile source of stains on the surface of the plate.

In the event of breaking the glasses of a yellow lantern or a focussing screen where such cannot be replaced, it is useful to know that glasses coated with iodized collodion, sensitized, washed and dried, answer the same purpose.

Critical Notices.

PHOTOGRAPHS OF SCENES IN PERTHSHIRE, ON THE THAMES, &c. By Vernon Heath.

We have recently had an opportunity of inspecting a series of photographs of Highland and other scenery by Mr. Heath, some of which were, we believe, a commission for Her Majesty the Queen. It has rarely been our duty to examine a series of pictures so replete with all which constitutes good photography and good art. The scenery depicted abounds with those features which are at once the charm and the difficulty of photography—foliage and water. To render either of these properly requires the highest skill and judgment, whilst to combine the two perfectly is the height of photographic success. In the pictures before us the success is complete in this respect. Almost every scene combines more or less of these features, but we may mention a view "On the Banks of the Earn," one "On the Banks of the Almond," an "Old Mill on the Almond," and a "Bridge over the Almond," as very perfect examples: foliage the most crisp and detailed, water bright, transparent and full of motion. A "Burn—St. Fillans," is one of the most charming bits of rock scenery and falling water we have ever seen. In all these there is the greatest brilliancy combined with most exquisite delicacy; great vigour and relief combined with the most perfect atmospheric gradation. Too often in photography, when a picture has been praised for vigour it has suggested hardness; when praised for softness it has been suggestive of lack of brilliancy: or, if the photographic characteristics were perfect, and it was praised for these, a suspicion of the absence of artistic elements has been created in the mind. Here, however, all the highest photographic qualities are united to a fine artistic feeling. In this respect we may especially refer to "A Peasant's Cottage." Here, amid characteristic scenery we have an old rustic Highland cottage: to give this value and life an old woman with her wheel sits in front of the door. "A happy accident," some one exclaims, looking at the picture; "I never have the good luck to meet with such characteristic figures in my landscape work." Such a person would stare when told that the cottage was found in one spot and the old woman in another, and that Mr. Heath took the old woman and her wheel several miles in a carriage in order to give life and keeping to the picture.

Judicious lighting is one of the great charms in each picture, and secures brilliancy and relief in the highest degree.

Two views on the Thames, near Maidenhead, are exquisite photographs. If it had been a matter under control something might have been desired in the composition notwithstanding that there are many elements of the picturesque. But the photography here, is perfect. A white cottage, green foliage, water, and black lock-gates are all rendered with perfect justice and fine effect. There are no white skies, a graduated tint or a natural sky being present in each picture. The printing of Mr. Heath's pictures is the finest we are in habit of seeing.

In all cases a bromo-iodized collodion and iron development was used. Mr. Heath has promised to give a brief account of his exact formulæ and manipulations for the benefit of our readers, who will doubtless look for it with interest.

A SERIES OF CABINET SIZE PHOTOGRAPHS OF PLACES OF HISTORICAL INTEREST IN ENGLAND AND SCOTLAND. By S. Thompson. A. W. Bennett.

This series consists of fifty pictures, and includes great variety of subject, most of the scenes from their own picturesque character or from historical association being full of interest. Few places, for instance, have so many charms of their own, combined with so many associations to add value to those charms, as some of the pictures which form a "Waverley Series" in this collection; the varied views of Abbotsford, Melrose, and Dryburgh, constituting, as Mr. Thompson phrases it, "the home, the favourite haunt, and the last resting-place of the Minstrel of the North." Here is the tomb of the bard, novelist, and historian, within the ruins of Dryburgh. It is one of the pictures which pleases us best. Mr. Thompson has been embued with the sentiment of the place, and has embodied much poetry in this photograph. We must confess we should not have admired a brilliant sparkling piece of photography here: we have, instead, a picture full of tender solemn repose; low in tone, but with fine, although sombre chiaroscura. We would suggest but one alteration, which can easily be made in printing: in vignetting such a subject the form of the gothic arch should not be repeated at the base, or, if done at all, care should be taken to make the repetition less regular.

A series of views of Oxford, contains some of the best pictures. A view of the High Street is very fine, the point of view well chosen, the composition good, and the atmospheric effect very fine. A view of the High Street and Queen's College is another good picture. "The Martyr's Memorial" is also a good composition. It is a little defaced by the spectral figure of a man, who has planted himself in the foreground exactly in front of the middle of the erection, and through whose unsubstantial body the railings which surround, and the steps which lead up to the monument, are clearly visible.

A "Series of Reproductions" contains copies of some very choice engravings, very carefully and skilfully executed, rendering with great delicacy all that is in the originals.

All the pictures we have examined are carefully executed: many of them are very fine, and exhibit judgment and taste. There are, however, one or two very palpable faults in some of them, which it would be unfair not to allude to. The first is the exceedingly unsuitable light in which some of the negatives have been taken, which gives a flat, tame, picture, without either brilliancy or relief; the manipulation is careful, the definition good, and all but the lighting is satisfactory. Another fault is in the mode of vignetting some of the prints, in which a hard abrupt line is manifest, where imperceptible gradation should have been present. We point out these faults for future avoidance, and do not wish to be understood as referring to nearly all; as many of the series comprise choice subjects, fine composition, and good photography.

PAINTED BACKGROUNDS, SET-SCENES, AND PROFILE ACCESSORIES.

We have recently had our attention called to a series of appliances for the photographer of a somewhat novel character, and which have been rendered necessary or desirable, by what has been termed the "cardomania." The appliances to which we refer, are the productions of the scene-painter, and are the work of Messrs. Bull, Brothers, of Great Queen Street.

There can be no question that the peculiar style of portrait which has become popular in album pictures, has given licence for, if it has not rendered imperative, a much wider range of accessory and scenic affect, than would be permissible in the sober simplicity which should distinguish miniatures generally. This fact admitted, it will follow without question that fitness, keeping, and variety, should always distinguish these accessories. The backgrounds and profiles of Messrs. Bull, are, if selected and used with judgment, pre-eminently well fitted to supply the requirement which this new and popular style of portraiture has created in the photographer's equipment.

Of painted backgrounds, we have seen a very choice selection with a great variety of subjects, representing interiors, close scenes, and open landscapes. These are all well drawn and carefully executed with a view to photographic effect. The greatest novelty, however, consists in a series of ingeniously contrived accessories in profile, arranged so as to combine with each other in almost endless variety. Columns and pedestals of every order, balustrades and vases, book-cases, chimney-pieces, writing-tables, &c. As may be easily conceived, accessories in this form admit of a variety of effect which it would be impossible to obtain by any mode of combining the actual furniture of the studio. One of the first questions which will arise to the mind of the artistic photographer will be as to the possibility of combining painted accessories so as to secure anything like true perspective, and light and shadow. It may be stated that the entire value of such adjuncts will consist in the ingenuity with which these difficulties have been met in contriving the series, and in the skill with which they may be arranged by the photographer. Messrs. Bull have done their part of the work with much judgment and forethought, and if an equal amount of ability be shown in using the profiles there will be no danger of incongruous effects. Each piece is contrived to stand alone, and to fit to all the rest. A pedestal may be used alone, or surmounted by a column, or by a vase; or joined to a balustrade, &c., the drawing, light, and shadow being in all cases made to correspond. For interiors, the chimney-piece may be surmounted with a clock, or chimney-glass, &c; a book-case, writing-table, or other adjunct of the library may be combined. A piece of well managed drapery will often be found very valuable in concealing the profile edge in the junctions and allow more latitude of position.

As we have said, the subjects are painted in a neutral tint suitable for photographic effect the backgrounds are on rollers, and the profiles sufficiently thick for rigidity without being heavy. The pigments are applied in distemper, so skilfully managed as to be perfectly flexible and free from danger of cracking.

As to the question of economy, the profiles, we believe, are, in all cases, less than fourth of the cost of the solid accessories; in some cases much more, and in some instances, such as book-cases, &c., they are easily used where real objects would be altogether beyond reach. The important point will be in all cases to use them with judgment: to avoid combinations incongruous or impossible in their actual relation; to observe that the light on the model and on the accessories is from the same source, and so to place each object, that the view it presents to the camera is compatible with perspective of the drawing in the scene or profile. Our only misgiving regarding the use of such articles lies in the possibility of abuse. For is it not a common thing, without such facilities for error, to see huge columns, and stone balustrades built upon carpets, and rich drapery hung in the open air? We hope, however, that the very multitude of effects rendered possible by such accessories as those under notice will render imperative a consideration of their harmonious use, and that the readers of the Photographic News at least will not contribute to swell the examples of such incongruities in pictorial delineation.

THE IODIDES: THEIR CHEMISTRY APPLIED TO PHOTOGRAPHY.

BY PROF. F. A. BOSSARD.*

Let us now return to the decompositions. To make it yet more comprehensive, I will give the following illustration: —165 grains of KI (+HO)+170 grains of $AgONO_5$ (+HO)=AgI+$KONO_5$+(2HO), we add the 165 grains of KI to the 170 grains of $AgONO_5$; then we have 165+170 =335 grains of solids in a mixture with water, in which is the equivalent of AgI=234 (grains+the equivalent of $KONO_5$=101 grains), thus giving together 234+101=335, which is the weight in full solids in the water. By filtering the whole, washing the AgI with pure HO, and drying it, we have the AgI separate, and by evaporating the total amount of HO we have the $KONO_5$ as solid.

I have been told by photographers: "It matters not whether I add iodide of potassium or iodide of silver to the bath, since iodide of silver is introduced in either case;" but they were not aware that, by introducing iodide of potassium, they obtain by double decomposition nitrate of potash as well as iodide of silver, and it is certainly of some consequence whether we introduce much nitrate of potash into the bath or not. Supposing we should, in the same manner, say—let us add iodide of iron to the bath, for it forms AgI just as well as the KI does. Truly it forms AgI, but still it forms $FeONO_5$ (protonitrate of iron), just as well as iodide of silver; therefore, by adding FeI to the bath solution, it amounts to the same thing as if we added iodide of silver and protonitrate of iron, or even a developer to the bath.

The best and most proper way to make and iodize a new bath is as follows:—Allow 9 grains of AgI to the ounce of crystallized $AgONO_5$; supposing I wish to make a bath of 4 ounces (avoirdupois=437·5 grains per ounce). As above stated, I use 9 grains of AgI to the ounce of crystallized $AgONO_5$. Therefore, 9×4=36 grains of AgI is wanted. This AgI we propose to make by a double decomposition between the KI and the $AgONO_5$. Now, to make exactly 36 grains of AgI, how much KI and how much $AgONO_5$ do I want? By following these rules, any one can always obtain a properly constructed and iodized bath. I figure it out in the following manner. We have two unknown quantities to work with, therefore let us distinguish them thus:—

Let x be equal to the quantity of $AgONO_5$,
and y be equal to the quantity of KI.

Wherefore x is equal to the product of $AgONO_5$ by 36 divided by AgI; and y is equal to the product of KI by 36 divided by AgI.

Thus ($AgONO_5$) 170×36=6120, and it, being divided by the equivalent of AgI)=234 would yield $\frac{5940}{234}=25\frac{90}{234}$ grs. Therefore $x = 26\frac{36}{234}$; and $y = 25\frac{90}{234}$.

Consequently, I would dissolve x grains of $AgONO_5$ in about two ounces of water; mix the two, and wash the precipitated AgI well. Lastly, I would keep 6 ounces of water upon the precipitate, and add the crystallized $AgONO_5$, stir up, and the whole will dissolve entirely; then dilute until it contains 45 grains per oz.

Whatever iodide we use in the collodion, by mixing it with the bath we obtain a nitrate of its base. Example: NaI+$AgONO_5$=AgI+$NaONO_5$, or CdI+$AgONO_5$=AgI +$CdONO_5$. The bromides are analogous to the iodides. Some of these nitrates have more tendency and power to decompose and develop the iodide of silver film, which has been acted upon by light, than others; and, since an extraordinary amount of sensitiveness can be formed by allowing the formation of certain nitrates, I deem it worthy to study the relative developing power between the different nitrates.

The most sensitive film is obtained by allowing the presence of a nitrate of such a base as has a tendency to *decompose* and *develop* the film of silver salts which has been acted upon by the light. Protonitrate of iron does it, and it should be upon the plate while exposed in the camera.

The manner in which the protonitrate of iron is formed upon the plate is not of so much importance as the quantity present; however, when it is formed upon the film by double decomposition, we have to take into consideration both salts which are formed and what effect each has upon the film. We come to about the same result by adding a very small quantity of protonitrate of iron to the bath, instead of the proto-iodide of iron to the collodion, especially since the FeI is so exceedingly unstable.

Some operators say that iodide of iron renders the collodion very sensitive. This is a mistake; it is no longer the proto-iodide of iron which renders the film sensitive, but the protonitrate of iron in combination with the silver. Should the proto-iodide of iron render the collodion itself sensitive, we should no longer require a bath of silver to sensitize.

Iodide of silver, whether it is made of iodide of cadmium, silicum, potassium, sodium, ammonium, or iron, is, under all circumstances, equally sensitive, provided there are no other nitrates or foreign substances with it; but if their respective nitrates are present, as is the case upon the collodion film, then the iodide of iron is at the very head and front of the whole list of iodides known.

To sum up the question, I would state, that it depends entirely upon the nature of the nitrate which has been formed by double decomposition. Another point we have to bear in mind is, that 5 grains of some iodides contain more iodine than 5 grains of others, according to the atomic weight. Therefore, the iodides are not all alike in strength, for 438 grains of iodide of ammonium contain no more iodine than 149 grains of iodide of sodium.

Let us coat a piece of paper with iodide of iron, then coat it with nitrate of silver (in the dark-room), then let us expose it while wet in the camera, and we obtain a picture which we need not develop. So it is with collodion that contains the iodide or bromide of iron, or both; it forms its own developer, and, if long enough exposed, does not require to be developed, for the picture appears gradually of its own accord, since the developer is formed by double decomposition. The chief trouble is, that the iodide of

* Continued from page 534.

iron is so readily decomposed in the collodion, that it is constantly unstable, and is converted into oxide of iron and free iodine, which colours the collodion red, and this free iodine, with nitrate of silver, yields iodide of silver and free nitric acid, since it has no base to act upon or to combine with. When we expose a plate with such collodion, which has turned red, owing to the decomposition of the iodide of iron, we form free nitric acid by dipping it in the bath, on account of the free iodine, and the free nitric acid first prolongs the exposure; secondly, it causes stronger blacks and finer whites; and thirdly, it prevents intensity; for, since nitric acid dissolves metallic silver, how much more will it prevent the formation thereof, and the intensity in a negative is but metallic silver. Nitrate of potash and nitrate of iron both whiten the film, but the nitrate of ammonium, being of an alkaline nature, does not thus whiten it.

Now I would state, that if we desire sensitiveness, we should see which is the best way to obtain a nitrate upon the sensitive silver film of a nature which has the power to decompose and develop the sensitized and exposed film. Now, the manner in which it may be done is left to the operator. Whether added as a nitrate to the bath, or as an iodide, a bromide, or even a chloride, to the collodion, it should, under all circumstances, form a nitrate of a slightly acid nature, like that of iron, and a nitrate which has power to develop the picture; and thirdly, it should be introduced in a pure state and in a small quantity only. There is hardly an end to this important subject, and I have still another important point to explain; I am only sorry that time compels me to make it as short as possible.

The above facts are sufficient evidence that it *does matter* what iodide is used for obtaining sensitiveness.

Now, let us see whether the kind of iodizer has anything to do with intensity or not. We have seen that the different nitrates possess different decomposing powers. We have alkaline nitrates, neutral nitrates, and acid nitrates. Of all the different kinds the alkaline nitrates possess the greatest decomposing power, as, for instance, the nitrates of ammonia, magnesia, and soda, and their iodides and bromides, all yield an excellent collodion. I especially recommend the iodide of sodium because it freely dissolves in the collodion, and does not decompose as readily as the iodides of magnesium or ammonium. When a collodion becomes coloured, and even turns red finally, it is almost unfit for negative purposes, for free iodine, producing free nitric acid as above-mentioned, prevents intensity. I only intend at present to treat on the iodides, otherwise I should have brought forward other reasons for intensity.

The presence of a certain amount of acid on the plate is necessary, whether we form it by iodine in the collodion, or whether the collodion is colourless and the bath contains the acid, is not of so much consequence as the quantity present. I have noticed that many English and French photographers prefer a colourless collodion with a slightly acid bath. An excellent photographer in Paris told me the following.

"I have used iodide of sodium in my negative collodion for the last four years, and I am satisfied that there is nothing better; but I have to make it myself, as I cannot depend on what I buy being pure. I prefer my present plan—to make the iodide of sodium—to all other methods."

We have seen that the iodides whose bases yield with nitric acid the strongest alkaline nitrate, and whose iodides are not easily decomposed, will yield the best negative collodion. However, most iodides yield, with a nearly neutral bath, a good negative, yet some stronger than others. If the bath is neutral, the collodion should be coloured; if the bath is too strongly acid, the collodion should be neutral; it depends principally upon the nature of the base of the nitrate. Another thing to be considered is, when we develop a plate we develop nitrate of silver into metallic silver, which causes the intensity; and consequently, when there is but little silver in a bath, we cannot expect to develop much. When we develop a picture, and it is not quite intense enough, we may improve it by developing with a weak silver solution, and when the developer is exhausted we may add to it. By such means we can nearly always remedy the want of silver in the bath, or rectify a weak negative.

In conclusion, I would state, that if we desire a strong negative we should first have a sufficient quantity of nitrate of silver; secondly, not have too much acid in the bath; and thirdly, use an iodide in the collodion which yields by double decomposition a nitrate of rather an alkaline nature.

I think I have now shown that the kind of iodizer employed has something to do with both intensity and with sensitiveness. I could give more evidence if desired, but time will not permit me just now. I hope everyone will agree with me on this subject; if not, I would like to have some one prove the contrary, as it is a subject worthy of discusssion.

PROTOSULPHATE OF IRON DEVELOPER.

BY COLEMAN SELLERS.*

When, in the very beginning of my studies in the photographic art, a professional operator told me,—"You are only wasting time; unless you wish to follow photography as a business, you had better let it alone." I did not feel discouraged, but rather stimulated to find some way so to systematise the various processes, as to avoid the trouble he pointed out to me, viz., chemical solutions getting out of order during the intervals of an amateur practice.

There was much truth in what he said about the necessity of having all things fresh, but when the matter came to be fully looked into, collodion and developer seemed to be the only real troubles. It is very annoying to find after an absence of some days from one's laboratory, that a picture cannot be taken in a hurry because there is no developer mixed, and the collodion has dried up. As to this latter trouble I will at present say nothing, but, as I have headed the article Protosulphate of Iron, will confine my remarks to that best of all developers.

A solution of protosulphate of iron, say four ounces to thirty-two of water, when freshly mixed, is more or less turbid, owing to a small quantity of basic persulphate of iron on the surface of the crystals; after an hour's rest this persulphate will have deposited itself, leaving the liquid clear. If in this condition it is filtered, the whole quantity of solution can be obtained quite clear, but will not remain any length of time without absorbing more oxygen and depositing more of the persulphate; should acetic acid be added to it, no precipitate will be formed, as the persulphite still forming will be dissolved by the acid and thus impart a dark colour to the solution.

If, when the iron solution is quite clear, it be filtered into the proper quantity of acetic acid, say thirty-two ounces into six ounces of acetic acid, the solution will be very clear, and if placed in an open bottle in a place where it is not liable to be disturbed, it will be found that for many hours no change will take place, but that after a day or two the liquid will have turned brown to the depth of about one-quarter of an inch, and this colour will extend downwards very slowly day by day—as fresh oxygen is absorbed, and the persulphate is dissolved by the acid nearest to it. This experiment has suggested to me the following way of preparing iron solution, ready for use, so as to be sure of its keeping.

Proceed exactly as I have above described, *i.e.*, filter the iron solution so that it shall be quite clear, and when it is found to run clear, let it drop from the filter into a bottle containing the quantity of acetic acid usually put to the developer, about one to five.

As soon as it is all filtered, and before it has time to absorb any oxygen, pour it into a number of small bottles varying in size from one ounce to six ounces, taking care to

* From the *American Journal of Photography.*

fill each to overflowing, then cork them up in such a way as to exclude all air; finally, tie down the corks with strings. In this condition the developer has, in my hands, kept very many weeks, and is at all times ready for use; if a small quantity is wanted, a small bottle is opened and used, and thus none is wasted. In my rambles in the country I have always thus taken my developer ready mixed, and have always had it clear and in good working order.

One caution I must give in regard to the mixture as above. No alcohol must be put into it to assist its flowing, as the alcohol is apt to be excited by the acetic acid into acetic fermentation. But the alcohol can be added when about to be used.

The reason why the iron solution should be filtered into the acetic acid, and not have the acetic acid added to it after filtration is, that the acid tends rather to prevent the persulphate forming, and gives time to filter and bottle; I consider this way of keeping the iron solution of the greatest importance.

My dark-room may be unopened for weeks, the bath left in good order and protected from too much evaporation; collodion kept in a cool cellar in the dark; iron solution ready for use as above described, and hypo solution for clearing in a well-corked bottle, are the essentials for work. Glass can be got ready in a moment (thanks to Mr. Kuhns) with a cloth dipped in a mixture of alcohol and acetic acid, then dried with paper, and when the picture has been taken it can be flowed with a solution of gum-arabic to which aqua ammonia has been added to make it keep. Since the adoption of the above arrangement photography has ceased to be a labour, and all things are ready at all times to catch a pleasant reflection.

THE COMPOUND ALBUMEN PROCESS.

BY MR. NOTON.*

It is essential to success in coating plates with albumen that the atmosphere of the place in which it is to be done is entirely free from dust or fibres, and naturally damp, with a temperature of 60° Fahr. Such not being the case in this room, I must ask you not to expect that I shall cover the plates free from defects in the presence of those photographic enemies.

The quality of the glass plates must not be overlooked. Plate glass is of course the best, especially where contact with another plate is required; but negatives upon flatted crown will do, either for printing upon paper or reduction in the camera.

A strong solution of soda with whiting will clean them, if new, or not too bad; this may be done the day before they are wanted. Rinse them well under a tap, wipe dry with a photographically clean cloth, brushing the fibres off when the elecricity has settled, and put them into a rack, with the face side to the left hand.

The albumen is the next consideration. The fresher the eggs, and if from country hens, the better. Crate eggs, not kept long, will answer pretty well. Darkness, and a low temperature, down to 40° Fahr., is good for albumen, either in or out of the shell.

The conversion of the organised mass of albumen to a liquid by beating, or disintegrating as I call it, cannot be too well done, for whatever process it is required, whether plain or salted; and should be prepared about twelve hours before it is to be used, and then filtered.

Pour the albumen upon the dry glass plate as you would collodion, and if it does not flow to your satisfaction, make it do so with a quill, a camel-hair pencil, or your finger: you will also have any quantity of another enemy, namely, minute bubbles. Three or four years back, I thought if I could but get albumen to flow as easily as collodion, I should be set up. I tried steaming, but found it did not answer, as part of the surface of the plate got dry before the albumen reached it. Ultimately, I hit upon the idea of mopping the plate over with a strong solution of soda, washing off front and back, and whirling rapidly for about ten seconds; I then found the albumen flowed as well as collodion. Another great advantage results from this—the plate is made chemically clean at the moment you are going to cover it: there is no risk of contamination from a cloth, nor fibres set afloat in your operating room. Still you must not pour the albumen on as you would collodion: albumen must never drop. The flange of the neck of the bottle must be in contact with the centre of one side of the plate. Tilt the bottle so that a quantity comes out on about the centre of the plate, then incline the latter up and down to spread the albumen. Keep working the liquid round and round, then cross-ways and length-ways of the plate several times, to mix with the moisture on it. Pour off into a cup, then whirl, slowly at first, increasing the speed afterwards; detach from the holder and slip the now albumenized plate on to a hot water plate to dry, which will take about a minute. When cool, sensitize and wash thoroughly; if a second coat of albumen is intended to be put upon the first, this sensitizing may be done in daylight; from the washing baths transfer it to a bath of iodide of potassium, or chloride of ammonium, then wash well again, fix the plate upon a holder, give it another swill with water from a jug, whirl rapidly, and coat and dry as before.

The plate when cool is ready to be re-sensitized in the dark room, or put away in a plate box without, for keeping.

If in time, dust or fibres get on the surface of the uncoagulated albumen, it may be washed off, and the first film re-coated.

* Condensed from a paper read at a Meeting of the Manchester Photographic Society, November 6th, and reported in the Society's organ.

Proceedings of Societies.

North London Photographic Association.

The usual monthly meeting of the Association was held in Myddelton Hall, on the evening of Wednesday, the 20th of November, G. Shadbolt, Esq. in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. T. Ross exhibited and explained a set of apparatus for producing 9 × 5 panoramic pictures.

In answer to various questions, he stated that the complete set of apparatus, comprising lens, camera, stand, bath, printing-frame, rest for cleaning glasses, box, &c. cost £22. The glasses with the required curve were 18s. a dozen. After a desultory conversation on the subject, some comments were made on the curved appearance which the lens gave to a straight road.

Mr. G. Wharton Simpson said that if the camera were placed so that a straight horizontal line were parallel to the axis of the lens, it would be delineated as a straight line.

The Chairman denied this, and said that all horizontal straight lines would be produced in curves by this lens when the picture was flattened out.

Mr. Foxlee inquired of Mr. Ross, if the lens would need to be focussed. Mr. Sutton said it would not.

Mr. Ross said unquestionably it would require focussing, as the aperture was large in proportion to the length of focus.*

After some further conversation on the use of the shutter with which the camera was furnished,

Mr. Dawson said he never could see the advantage of such shutters, nor the propriety of calling them instantaneous. The most simple and rapid means of uncovering and covering the lens that he knew was, simply using a piece of black cloth in the hand. Any shutter attached to the camera had a tendency to shake it when in use.

Mr. Ross thought there was no necessity for shaking the

* To obtain the value of the pencil incident on the first refracting surface of the panoramic lens, square the diameter of the aperture in the middle of the lens; multiply this number by two, the square root of the result gives the equivalent diameter of the pencil. The diameter of the stop in the one exhibited is 25 inches, and by the above process it will be found that the equivalent diameter of the pencil is ·3535. The focal length of the lens is 5·5 inches, divide this number by ·3535 we then get the ratio of the diameter of the stop to the focal length, which is nearly 1-16th, so that the aperture may be considered large for a view lens.

camera if carefully used. This shutter had the advantage of exposing the foreground first.

Mr. Dawson denied this, and regarded the idea as entirely a fallacy. The fact that the shutter exposed one part of the lens first, simply had the effect of a diaphragm. The whole of the image would be produced by the small portion uncovered.

Mr. Ross said that would only be the case with a single lens.

Mr. Dawson said that views were usually taken with single lenses.

Mr. Simpson thought there was some misapprehension on the subject. With regard to combinations of lenses, a shutter exposing the bottom of the lens first would unquestionably expose the foreground first. But the same would hold good, to a certain extent, of single lenses. If the shutter were in immediate contact with the lens, then the exposure of one part before the rest would have a similar effect to a diaphragm. But if the shutter were placed at a distance in front of the lens, it could be placed so as to expose any part of the view first, by shading or cutting off the rays from the other portion. The shutter in question might be raised in such a manner as to shade off the sky during part of the exposure, and give the foreground more exposure. The shutter so placed, really obstructed the view of the lens, if he might so speak, and prevented it seeing the sky.

Mr. Seely remarked that if a central stop in front of the lens were placed at too great a distance from it, part of the view was cut off, and the field limited.

The Chairman said anything placed in front of a lens so as to cover it partially, must act either as a diaphragm or an object. The question of distance, as Mr. Simpson had remarked, determined which. If it were at a certain distance from the lens, it would act as an object cutting off part of the view as the corner of a house might sometimes do.

After a few further remarks the subject dropped.

Mr. Martin then read a paper which had been entrusted to him by Mr. Hislop, who was unable to attend. The paper was on the advantages of using simply collodion plates, and affirmed that whatever characteristics a collodion possessed when used in the wet process, would be retained when excited, carefully washed and dried, without the use of any preparation or preservative. The article will appear at length in our next.

The Chairman asked if the plates were always coated with some preparation, or were used with a coating of collodion on the bare glass?

Mr. Martin said that the film had a tendency to leave the glass, and that Mr. Hislop therefore always coated the plate with a very dilute solution of albumen prior to applying the collodion.

Mr. Simpson suggested that in that case, Mr. Hislop was overlooking the fact that the organic matter thus supplied would have a chemical action, as well as the mechanical one of attaching the film.

Mr. Martin said that Mr. Hislop coagulated the albumen by holding the plates before a brisk fire, after coating them.

Mr. Simpson said that heat so applied would dry the albumen; but would not coagulate it. Dried albumen was not coagulated by heat.

Mr. Martin said the plates were held before the fire previous to drying, whilst the albumen was still wet.

Mr. Simpson very much doubted whether it was possible with albumen so highly diluted—8 parts of water to one of albumen—to coagulate it in that manner at all. Heat so applied, would, he apprehended, dry without coagulating it.

After some further conversation, in which Messrs. Shave, Moens, Dawson, Bingham, and others, took part,

The Chairman remarked that Dr. Hill Norris had announced the fact as early as 1854, that a washed collodion plate was sensitive to light. Subsequently, Mr. Barnes made use of the identical process which Mr. Hislop was now recommending, namely, that of coating the plate first with dilute albumen, and then applying collodion, exciting, washing, and drying. Regarding the action of the albumen, suppose it even were coagulated, the nitrate of silver bath would come into direct contact with it, and form an organic compound. Or if even nitrate of silver had not come into contact with it in sensitizing, it would in developing; there was no question that the albumen would form an organic compound with the free silver, which must come into contact with, and materials be supplied to aid in forming the image, and giving intensity. Even were there no albumen coating, it should not be forgotten that the pyrogallic acid supplied the organic matter, and thus aided in getting the image. He was not aware whether a simply washed collodion plate would give an image with an iron developer.

Mr. Simpson said it would—he had tried it; but the image was very thin and weak.

The Chairman said even then acetic acid would probably be used, and still supply the organic element.

Mr. Simpson said acetic acid was used in the developer.

Mr. Dawson remarked that the nitrate of silver would doubtless come into contact with the albumen, as it would penetrate through the collodion. He remembered once exposing a plate on the wrong side. The result was an image which could be seen by reflected light on the glass side, but not on the collodion surface. The image was really between the glass and collodion film.

Mr. Simpson had on one occasion a negative which split from the plate, and left a very definite image on the surface of the glass. Regarding the operation of the albumen, it was proposed some years ago to be used in the wet process as a certain means of gaining intensity. He remembered Mr. Hughes showing him some remarkably fine negatives obtained in that way. They had the rich brown tint of albumen, the great drawback was, that they soon spoiled the bath.

Mr. Bingham asked if the albumen was coagulated in that case.

Mr. Simpson said it was not.

The Chairman referred to Mr. McNab's use of a similar process, and his difficulty in its spoiling the bath, and the plates not keeping. He (the Chairman) then suggested to him the application of protosulphate of iron to the albumen film, which at once made them keep, and, indeed, restored some which had shown spots of mouldiness.

Mr. Martin remarked, in regard to the effect of dry heat, up to a temperature of 130° it dried, and did not coagulate the albumen. What would be the effect of a higher temperature he had not tried.

Mr. Simpson suggested, that from his experiments in that direction, he was inclined to think that a suitable non-contractile collodion would adhere without any previous preparation of the plate.

The Chairman had not found any collodion that would do it.

Mr. Martin thought in the choice of a suitable collodion lay the whole question. Many collodions could not be worked free from stains when merely washing.

After some further desultory conversation, the proceedings were terminated by the usual votes of thanks.

The American Photographical Society.

The Society held its regular meeting for October, on Monday evening, 3rd inst., in the Chapel of the University; Vice-President Joy in the chair; G. H. Babcock, secretary *pro. tem.*

Water in Collodion.—Mr. Tillman stated that he had received a letter from Dr. J. M. Sanders, in which the doctor claimed that the addition of about two drachms of water to the pint of collodion was a great improvement, especially for ambrotypes; the impression was more brilliant and whiter.

Mr. Kuhns.—Water in collodion is not new. Indeed, most photographers complain that in the ordinary methods of making collodion they introduce too much water. Whether or not there is advantage in a small quantity of water in collodion, there is no doubt there is a limit, for certainly too much water will produce the most troublesome markings and other defects.

Daguerreotype Experiments.—Mr. Johnson presented some results of experiments to illustrate the persistence of the sensitiveness of Daguerreotype plates. The plates were coated with iodine only, and exposed in a camera before brightly lighted objects for several days; in one case for fourteen days. New objects were also from day to day added to the field. The objects were all depicted on the plates, even those placed in view on the fourteenth day.

Specks on Photographs.—Mr. Babcock stated that the photographs made a year ago for the graduating class in New Brunswick, had by degrees become almost ruined by the appearance of minute white specks all over the surface. He would like to have the opinion of some of the members as to the cause.

Mr. Kuhns being called upon, said it would be impossible to do justice to the case without a careful examination of the specimens. The defects in question may come from a variety of causes, drops of acid, salt, particles of dust, foreign matter in sizing, paste, &c. I suspect they were not preserved in a proper place.

Mr. Babcock.—A dozen of those which are spoiled, were kept in a large paper envelope in a dry room of a private house.

Mr. Kuhns.—I would look then for an explanation to the paper used, or to the unskilfulness of the photographer.

Photographic Notes and Queries.

Toning Bath.

Sir,—I beg to forward for the readers of your valuable News a receipt for toning.

Chloride of gold	2 grains.
Common salt	2 drachms.
Distilled water	8 ounces.

Place the print from the printing frame in the above bath, and tone to a deep purple or blue. Then fix in hypo, and the prints will assume a beautiful carmine purple, I remain, yours &c.,

A. H.

Splitting of the Film.

Sir,—After reading with some interest the suggestions of various correspondents addressed to a "Perplexed Amateur," in the current number of the Photographic News, I am inclined to the opinion that the adoption of the proposed precautions, would not entirely prevent a recurrence of the splitting up of the film. Although a large number of pictures taken upon Fothergill plates, may oftentimes be developed and dried without the occurrence of the annoyance under consideration, yet the experience of your 'correspondents' proves its occasional appearance. I have noticed myself that the perplexity is more likely to occur when working upon stereo or small sized plates, than upon larger ones; this may possibly arise from the fact that the dried collodio-albumen film possesses less elasticity towards the marginal portions of the plate, than in the central parts. I agree with Mr. Keene that the ten volumes of water added to one of albumen dilutes the latter to too great an extent for giving the most efficient and adhesive mixture. The question, however, under consideration is not so much with respect to the general adherence of the film to the glass, or a liability of its detachment from the edges, but rather of unequal contraction. In fact the attachment of the edges of the film to the margins of the glass by the aid of varnish increases rather than diminishes the difficulty to be overcome. I do not think, moreover, that the introduction of the salts of bromine, or, indeed, the nature of the sensitizing compounds generally, have any immediate connection with the defect complained of. The avoidance of the difficulty must rather depend upon the alteration of the physical character of the collodio-albumen film, so as to render it less horny and contractile. This may be effectually accomplished by the application of a preservative solution containing an admixture of grape sugar combined with the albumen. This mixture may be easily and uniformly prepared, as I have previously noticed, as follows:—

Raisin extract	1 vol.
Albumen	1 ,,
Water	1 ,,
Ammonia	⅔ fluid oz.

Agitate the whole together, and filter after the lapse of a week or more, through ordinary filtering paper; it will improve by keeping. Your correspondent will find that by substituting the above for the ordinary albumen mixture, he will obtain a film possessing sufficient elasticity and adhesiveness as entirely to prevent the repetition of the annoyance to which Fothergill plates are occasionally subject. I trust that a "Perplexed Amateur," will by no means discard the collodion which he has been lately using, but test the efficacy of the various suggestions in connection with the sample so eminently suitable for the trials. He will, of course, favour us with the results of his future experiments for our mutual edification and instruction.—Yours truly, T. Sebastian Davis.

Sir,—Many remote and ingenious causes have been assigned by your other correspondents in last week's News, for the difficulty experienced by a "Perplexed Amateur."

The proximate and true cause I believe I pointed out from my own very recent experience.

Though it may be too simple and unimaginative to be attractive, I would urgently recommend a "Perplexed Amateur" to give it a trial, and let me know the result.—I am, sir, yours respectfully, Edwyn Offer,

Manchester, Nov. 26th.

Sir,—If the correction is worthy the trouble, I would write that in my reply to "Perplexed Amateur," last week, the compositor made me say *gum*, instead of *grind*, the plates. A small word makes a vast difference in sense. Would you inform me in your correspondence corner, can I procure No. 2, Vol. I., which I have somehow lost.—Very obediently yours, M. Willett.

Dear Sir,—I tender you my best thanks for the valuable space you have kindly devoted to assist me out of my perplexities, also to those gentlemen who have so promptly offered their advice.

I, like Mr. Edwyn Offer, was ready enough to lay the blame to the hypo, but if he will refer to my letter, he will find that as a test, I proceeded no further than developing the picture, when on drying, the film split up as stated; consequently the cause could not be from either the alkinity, newness or strength of "poor hypo."

Mr. M. Willett suggests varnishing the edge of the plates, and drying in an oven; both these precautions were taken, the former is a good remedy against the film being washed off the plate, but the splitting up is quite another disease. Mr. Keene is so high an authority on dry plates, that I regret I cannot accept his suggestion that the *weakness* of the albumen wash is the cause, if this were so, a simply washed plate would be still more liable to split up; besides, with the wet plates, no albumen was used. I have tried his remedy of flooding the plate with albumen after fixing, and saved several plates, but I was anxious, if possible to find out where the fault lies, and if possible, get rid of the complaint altogether.

Teesdale appears to have suffered in like manner to myself, and his suggestions are practically the same as your own, viz.: it is either the collodion or dirty plates, it may very possibly be the latter, if so, I should like to know how to tell when a glass plate is *really clean;* mine were washed in soda and rain water, well rinsed, cleaned with a mixture of nitric acid, alcohol, and tripoli, and polished off with a clean piece of silk.

Apologizing for troubling you with so long a letter, I remain, yours very truly and obliged, A Perplexed Amateur.

London, November 26th, 1861.

Mounting Photographs.

Dear Sir,—Having read your highly interesting paper with much pleasure, upon the mounting of photographs, I beg to call your attention to a substance that will be found exceedingly useful for the purpose, viz., "Gum Tragacanth," well known in commerce as "Gum Dragon." Its qualifications are as follows: simplicity in mixing; ease in application; not being injurious to the photograph; and readily separating from the mount when required. The mode of preparing is this: in an ordinary marmalade jar put about a dessert spoonful of the gum, three parts filling with cold water. This done overnight, in the morning there will be sufficient paste to mount a number of prints; and if by any chance the surface of the photographs, or the margins of the mounts are touched with the gum, it can readily be removed without injury to either.

Should the foregoing be of any service to your readers, I shall be glad of its publicity.—Yours faithfully,

W. Gregory St. George.

31, *Gloucester Place, Kentish Town, N.W., Nov. 25th,* 1861.

[We have occasionally used a paste made of gum tragacanth, and merely omitted it from our paper on account of the great length to which our remarks had run. We can speak of it as very suitable for the purpose.—Ed.]

Curious Transformation.

Dear Sir,—Some few days since I mixed some gum guaiacum with Ponting's negative collodion, which is perfectly colourless. In about two hours it was of a fine prussian blue; in two or three more of a rich purple, and in the evening of a fine ruby red; the next morning it was bright yellow, and it is now quite colourless again. Not being able to account for this phenomenon; I should be glad to know if any others who have tried this process, have met with anything similar.—I am yours respectfully, H. Cooper, jun.

5, *Aberdeen Park, November 27th,* 1861.

Miscellaneous.

The Province of Photography in Art.—The question of the range of subjects proper for fine art becomes year after year more needful as photography advances. To us it seems pretty clear that, for everything in the way of mere transcript, photography is the thing; it is easier, more certain, more ample, and in almost every respect, as far as this object is concerned, more beautiful, and to crown all, incomparably cheaper. It has already made huge inroads upon this field of art, and is morally sure to monopolize it at no distant day. What photography cannot do is to colour, and to invent. To say that it will never be able to colour would be extremely rash; some glimmerings of that power in photography have already been bruited, and there is no knowing where this, or any other human conquest of the forces of nature will stop. All we can affirm is that, for the present, the sublime and delicious province of colour lies exclusively at the command of man. Of invention, photography has already in its nature and practice a certain very limited property. The power of invention is the conceiving how a thing which does not materially exist, would be, and would look if it did exist; and the photographer who arranges and takes fancy groups, produces, in a sort of way, a result similar to the artist who, with or without models, represents a subject conceived in his mind. But this is, as an almost constant rule, bad invention, and futile photography; it cannot possibly compete with, though it in some degree shadow forth, the power of artistic invention. The imminent condition of fine art appears, therefore, to be the limitation to invention and colour, transcription and record of mere fact of every order being handed over bodily to photography. This does not, however, include human portraiture, which, in its higher walks, has a large measure of invention. There is nothing to irritate or alarm us in the prospect. We shall have the best possible inventions worthy of contemplation. An enormous quantity of art pursued at a ruinous sacrifice of time and labour will find a painless extinction, and the public be thereby delivered from shoals of inefficient trumpery or useless essays; the true and great art will survive; the artist knows and works out his own invention.—*Frazer's Magazine.*

Talk in the Studio.

South London Photographic Society.—The Experimental Committee, in connection with this society, are about to institute an inquiry into the nature of the latent image, and the modes of developing it.

Birmingham Photographic Exhibition.—In our announcement of the prizes in connection with this Exhibition, we referred to it as closed. This was an error into which we had been led by the statements of some correspondents. It is not yet closed, but will be on Saturday. Contributors will then be able to receive back their pictures.

Photographs of Races.—A correspondent informs us that Lord Canning has ordered a collection of photographs to be made of the various races in India. Such a collection, carefully executed will possess great ethnological value.

The Florence Exhibition.—The Italian correspondent of the *Daily Telegraph* says:—The medals for photography are now given, and the "full length" of the King, of which I have before spoken, is at the top of the list. Duroni, of Milan, has the best portraits; Mr. Warren Vernon the best landscapes. A man from Perugia has also some good likenesses. The King has bought the fine pictures of the Colosseum and the Capitol, sent from Rome. Much more justice might have been done to this branch of science had the light been more considered. The photographs are displayed in a semicircular gallery, without the least regard to their shape, size, or their lights and shades. It is a fine collection.

To Correspondents.

*** The Photographic News Almanac will be ready in a few days. It will form a complete epitome of the art, with all improvements, as at present practised.

O. B.—The almanac will be forwarded in a few days. We believe there is no difficulty in working the pistolgraph. We have never seen any solar camera pictures enlarged from pistolgrams. We fear the results would not be very perfect, unless the lens of the pistolgraph was stopped down very much, which would decrease its rapidity. The other lenses you name would be most suitable, and answer your purpose best.

W. H. Warner.—The prints are received, and shall be handed over to the Society at the next meeting. The "Two Bridges" is very charming.

One who works alone.—Acetate of soda has a slightly alkaline reaction, and may possibly, if there be only a slight trace of acid in your chloride of gold, neutralize it. If not, add the slightest amount of carbonate of soda, which will produce neutrality. 2. Hyposulphite of soda may be kept in solution without danger; the term a "fresh solution" simply means one which has not been used before. It is a good plan to keep a piece of chalk in the hypo if it be used more than once. Fresh hypo will not need it. 3. The No. 1 and 2B lenses you inquire about, both answer well for card portraits, and are both exceedingly rapid. The No. 2B covers most perfectly for standing figures, and may be used with full aperture. To get perfect definition about the feet of standing figures with the No. 1B, a diaphragm —not a small one—should be used, which would give the advantage of rapidity to the 2B for standing figures. When both are used with full aperture, we believe they are about equal in rapidity. We have seen excellent results from both. The No. 1B requires, we believe, about 12-ft., and the No. 2B 18-ft. or 20-ft. We have not tried the card lenses of the other maker you name.

F. W. Sutton.—To become a member of the Photographic Exchange Club, it is necessary to send name, address, and pictures for exchange, to the secretary, Mr. Frank Howard, 12, Whittingham Villas, Studley Road, Stockwell.

M. D.—Kaolin may be kept in the stock bottle of silver solution for printing. Care should be taken that it does not render the solution alkaline, as some samples will do.

Sigma.—We are afraid that there will be some difficulty in cleaning a tin still from rust. Can any of our correspondents give information? 2. You may remove the iodide from your old paper negatives with hypo. 3. To take the portrait of an old lady in widow's cap and black dress, use a bromo-iodized collodion and iron development. Since you work out of doors, hang up a sheet, or in some other way form a canopy to screen off some of the direct top light. Use a grey back-ground, and expose long enough. The best mode of separating the white from the yoke of an egg cannot be very well described. It is simply a neat piece of manipulation. Break the egg on the edge of a cup, and separating the halves of the shell slightly, allow the white to run through between them, taking care that the aperture is not sufficiently wide to allow the yoke to follow. Ask the cook to show you the operation. 5. One of the simplest methods of drying plates is to fill a jug with hot water, and lean the plates against it. 6. We believe Dr. Hill Norris's plates, when properly used, generally give good results. 7. We know nothing, except what is stated in the article 8. The Amateur Photographic Association is still in existence. 9. We will inquire. Much of the information you now want you will find in the Photographic News Almanac, which will be published in a few days. We should be glad to see your selection of extracts, or a copy of it at some time.

G. Guyon.—To divide the glass rods to which you refer, take a piece of iron wire, and bend one into a ring, which will easily slip upon the rod; make the ring red hot, and rapidly slip to the part you require divided. On removing it, plunge the rod into cold water. A mark all round with a file first would give more certainty of a true fracture if you are not expert in manipulating. 2. The difference between pure spirit and methylated consists in the fact that the latter contains 10 per cent. of pyroxylic spirit, or wood naptha. This addition to the pure spirit exempts it from excise duty. 3. We do not use distilled water in toning generally, but if you find your common water throws down a precipitate with phosphate of soda, by all means use distilled water.

N.—It was announced some time ago that the present volume would terminate at the end of the year, when an index and title page will be published. Regarding the large pictures of M. Alophe, we were informed by an able professional photographer, who had recently been to Paris, that on a careful examination, he discovered very palpable retouching. We shall hope for an opportunity of seeing them.

An Amateur in Trouble.—To prevent the film leaving the glass during intensifying after the plate is dry, it is important in the first that the glasses be scrupulously clean and dry before collodionizing. A narrow margin of black varnish run round the edge with a camel's-hair pencil, before wetting the plate again, is also an aid. A suitable collodion is imperative in such cases; if, with the precautions we have named, you still lose your films, change your sample of collodion, and try another maker.

F. O. B.—The addition of a bromide may increase the sensitiveness of your old coloured collodion. You may find it useful to mix in small proportions with samples which are too new.

W. B.—Some of our correspondents seem to have a strange notion that they have a claim upon us for private advice, and that by enclosing a stamped envelope they make that claim imperative. If we were to admit such claims our time would be more than occupied in correspondence. Where we answer letters privately it is because we see reason to do so; and the act being one of supererogation entirely, we claim the right to decide the propriety of answering privately, or in the News. Where a reply in the the answers to correspondents will, in our opinion, answer every purpose, the fact of a stamped envelope being enclosed cannot be supposed to compel us to write a private letter. Our time is more than fully occupied at present.

Inquisitive.—You will find a recipe for a toning bath with gold and chloride of lime in the Photographic News Almanac, which will be published in a few days. 2. Your silver bath is probably alkaline. Add a few drops of nitric acid.

W. J. C.—The lens you mark No. 4 will answer your purpose. The price is about £5. You omitted to append numbers to the prints, so that we cannot tell to which the various remarks apply. They are not printed sufficiently deep. Print at least twice as long, and send us some further specimens.

P. N.—We prefer No. 2 on your list. The whole plate triple will suit the length of your camera. A single lens would be of longer focus.

Novice.—You will find particulars of the acetate of soda and gold toning bath in several recent numbers of the News. There is an article on the subject in the Photographic News Almanac, to be published in a few days.

John Crabtree.—We have never used either of the lenses you name. It is impossible to state the time any dry plate will require to be exposed, as everything depends on focal length, the aperture, the light, the subject, &c. From three to five minutes may be an approximation with a lens of 11-in. focus, and ⅜-in. stop.

THE PHOTOGRAPHIC NEWS.

VOL. V. No. 170.—*December* 6, 1861.

PHOTOGRAPHY AND THE INTERNATIONAL EXHIBITION.

THE Committee for Aiding in the Management of the Photographic Department of the International Exhibition is now appointed, and consists of the Earl of Caithness, Mr. Kater, and Dr. Diamond. The two first-named gentlemen are members of the Council of the Photographic Society, and Dr. Diamond is its secretary. Mr. Peter Le Neve Foster, who is appointed Superintendent of the Photographic Department, is also a member of the Photographic Society's Council, and Secretary to the Society of Arts. We hope from the high character of these gentlemen, and their great interest in photography, that the very best arrangements will be secured for a satisfactory representation of the art in the forthcoming competition of nations.

PHOTOGRAPHS BY MOONLIGHT.

WE recently called the attention of our readers to an article in *La Lumière*, in which our notice of Mr. Breese's moonlight pictures was regarded as a "puff of the work of some rich English lord." The article, with its array of figures to prove that moonlight pictures were impossible, was amusing rather than otherwise, and reminded us of an answer said to be given by a Frenchman, who having pursued with great volubility an argument similar to that of M. Gaudin, was told that "facts were against him." His answer was: "So much the worse for the facts." We related the thing as *un fait accompli*. M. Gaudin contended it could not be done. We stated the circumstance as a fact: he responded that it did not accord with any theory *he* knew, and was, therefore, impossible. As we were not in possession of Mr. Breese's method of working, we did not enter into any discussion of the theoretical question, but contented ourselves by re-stating what Mr. Breese said was a fact, adding that the pictures bore evidence of the truth of the statement; and suggested to M. Gaudin more caution in asserting what was possible or impossible in a science like photography. These remarks, M. Gaudin referring to the subject again, chose to regard as "virulent," and as we do not at any time care to bandy hard words with our contemporaries, we were content to let the matter pass without further notice.

At this stage of affairs, however, the matter is taken up by our Liverpool contemporary, who steps in as moderator, and suggests that the whole difference arises out of an error of nomenclature. As we cannot in any sense allow the truth of his explanation, which appears to be made without having sufficiently remembered the case as stated, we must once more refer to the facts. We must first make an extract from the remarks of our contemporary. Referring to M. Gaudin's article he credits him with giving—

"Very philosophical reasons for concluding that in the present state of chemical knowledge, it would be impossible to produce a *bonâ fide* 'moonlight' view. While equally convinced of the correctness of this conclusion, we did not, like M. Gaudin, attribute the assertion made to mendacity, but to some misapprehension. . . . It turns out that the pictures to which allusion was made are instantaneous stereographs of the moon—a very different affair to instantaneous moonlight views, for by all the ordinary rules of language the latter designation would apply only to views illuminated by the reflected light from the moon's surface. Of course Mr. Breese is not responsible for the erroneous nomenclature. We might take a negative of the flame of a candle, but we should not, therefore, be able to take a candle-light view. We cannot doubt that Mr. Breese has made some very considerable advance in exaltation of chemical sensitiveness as the production even of instantaneous lunar images evinces; and we sincerely regret that from so droll an error of language he has been subjected to so much suspicion."

We have simply and emphatically to deny that there is any ground for this solution of the case, or that there is any such error in nomenclature. The authority quoted for such an explanation is a letter from Mr. Brown, secretary of the Birmingham Society, in another page of the same journal. On referring to this letter we find that the term "moonlight views" is repeatedly used, but there is also on one occasion the phrase "instantaneous views of the moon," and upon the suggestion conveyed in this phrase our good friend, the editor of the *British Journal*, not having seen the pictures, jumps to the conclusion above indicated.

In the original criticism which has given rise to all this discussion, and which contained, we believe, the first public notice of these pictures, we were very careful in describing exactly of what they consisted, and gave just such information as to their mode of production as we received from Mr. Breese. We here quote from our description given at the time:—

"There were three pictures rendering moonlight effects. One is a moonlit sea, with the play of the moonbeams on the water. Another is the moon itself in the midst of a mass of cumulose clouds, which are tipped with silver, and rendered more or less transparent throughout by the moon's light. The third is an interior with the figure of a lady looking out of the window, through which is seen a moonlit sky. The figure is, of course, little more than a silhouette, the edge of which is traced by a well-marked line of light. The white lace sleeve on the arm which rests upon a table underneath the window is well made out, as is also the polished surface of the table reflecting the moonlight."

A description in nearly the same words appeared shortly afterwards in our contemporary's own pages. How, therefore, he can now suggest that the term moonlight scenes is a "droll error of language," and the cause of the misunderstanding, we are at a loss to conceive. We must, however, distinctly repeat it, these stereographs are views of objects professedly illuminated by the light of the moon, and not simply views of the moon itself. They are decidedly what we have described them to be, or we, and all to whom they have been shown, are the victims of a gross imposture, a thought which since we have met Mr. Breese we have never for one moment entertained. In regard to their instantaneity a word or two may be necessary. We have never described them as instantaneous. That, we believe, is a little modification originating with M. Gaudin. The terms we used in speaking of them were that Mr. Breese stated that they had required "*little more* than instantaneous exposure." In order to do him full justice, we may add that he has since informed us that one portion of the interior, which was from two negatives, had an exposure of about seven minutes, whilst the other portion was really instantaneous. We may add that since our notice first appeared, we have had more than one communication from correspondents who have attempted moonlight pictures, and one who states that he recently obtained a negative of the moon and surrounding clouds, with a simple bromo-iodized collodion and iron development. M. Gaudin tells us that to obtain a photographic image of moonlit clouds, would require an exposure three hundred thousand times as long as would be necessary in sunlight. Regarding such a question, we are simply inclined to quote the old paradox, "There is nothing so false as facts—*except figures!*"

We shall not make any comment upon the "philosophical" character of M. Gaudin's reasons, in which our contemporary joins him, for concluding that "in the present state of chemical knowledge it would be impossible to produce a *bonâ fide* moonlight view," because it has never been stated that these views were produced by the aid of "the present state of chemical knowledge;" but, on the contrary, it has been distinctly claimed by Mr. Breese that it was by the aid of a secret which was *in advance* of "the present state of chemical knowledge"—a circumstance unhesitatingly admitted in another part of the same article.

Since the above remarks were written, Mr. Brown has forwarded a letter to the Photographic Society of London on this subject, which will be found in our report of the last meeting in another page. In this letter it will be seen that a similar description of the pictures is given to that which first appeared in our pages, and a promise is made of bringing the subject, together with specimens, before an early meeting.

It may be necessary to explain the allusion which terminates Mr. Brown's letter, having reference to Mr. Cramb, of Glasgow. Some remarks in a nonsensical article by that gentleman, and some other remarks he made at a meeting of the Glasgow Society, contained unjust and untrue strictures on the Birmingham Exhibition generally, and Mr. Breese's pictures particularly. The fact of being uttered in a respectable society, and printed in a respectable journal, gave sufficient amount of importance to these remarks to induce Mr. Brown to forward to the same journal a dignified refutation of the charges, and a proper comment on what he terms, "a class of men who occasionally act as the self-appointed judges of works they evidently cannot appreciate."

GREEN GLASS FOR THE DARK ROOM.

A short time ago our German correspondent, Herr Liesegang, recommended the substitution of green tint in glass for the orange colour generally used for the dark-room windows, on the ground that it was more pleasant to the eye and quite as efficient in repelling the actinic rays. At a late meeting of the Manchester Society Mr. Petschler, who recently visited Germany, made a similar suggestion, stating that he had seen it used with perfect efficiency in Herr Liesegang's dark-room. He had since tried the experiment himself with success; but he had adopted the precaution of using a screen of yellow underneath the green.

Without denying that there are circumstances in which such a light might be used with impunity—such as the absence of direct sun-light, and a circumscribed area for the admission of light, &c.—we would caution our readers against adopting such a method of illuminating without careful trial in the first instance by exposing an excited collodion plate to the window and then developing it.

At the last meeting of the Manchester Photographic Society, Mr. Sidebotham stated that he had made some experiments with different coloured glass in reference to this subject. He found that the green glass was altogether inefficient, and exhibited a sheet of paper which had been rendered sensitive, and exposed under glasses of different colours. That portion covered by the green glass was considerably darkened. Ruby and orange were the only colours which he found entirely prevented photogenic action. An excited collodion film gave similar results.

We have examined various samples of green glass and yellowish green by the aid of the spectroscope, and have found in every instance that not only are a great portion of, or all the green rays transmitted, but in most cases many of the blue rays as well. The samples of glass which we have found entirely resist the actinic rays, are the silver-flashed glass of an orange yellow, some samples of pot metal of a pure orange, and a few samples of red. Too much attention cannot be given to this subject, as it is of vital importance. Those of our readers who have not ready facilities for testing their yellow glass will do wisely to forward samples to our office for examination. We shall have pleasure in reporting as to their character, but we cannot undertake to say where non-actinic glass can be purchased, as dealers are of course continually changing their stock, and we cannot with certainty say that the quality may not change at the same time.

IRON NEGATIVES AND BRILLIANT PRINTS.

Development.

We now proceed to offer a few further remarks on this subject, which, from press of other matter and duties, has been for some time in abeyance. The developing process, more than any other, requires the exercise of a judgment cultivated by experience. Nothing but experience can be an efficient guide to the eye as to the printing value of the gradations seen in the negative. A few hints, the result of our own experience, may, however, be suggestive.

A singular disparity in the strength of the iron-developing solutions used by different skilful operators prevails. The explanation will be found, probably, in the results aimed at by each, and by the mode of working throughout, which accompanies each character of developer. As a general principle a weak developer will give greater contrast, and a strong developer more harmony and softness. Where the developer is weak its action commences first on the highest lights, and as the development goes on slowly there is a tendency to aggregation of deposit in those parts, so that getting more than their share of the free silver on the plate, these parts acquire density sometimes to the loss of the more shadowed parts, the silver belonging to which is partly thrown down on the lights. With a strong developer, on the contrary, the reduction is rapid and more uniform, the detail in the shadows is rapidly brought out, and the deposit reduced from the free silver is not appropriated in undue proportion by the high lights.

From this view of the case it will readily be seen that the selection of strength and character in the developer must, in some degree, be regulated by the mode of intensifying to be adopted. Where the mode of intensifying by pyrogallic acid and silver, immediately after development with iron, and before fixing, is adopted, a weak iron developer is best; because the pyrogallic acid solution in such a case reduces the silver, added with it, in equal proportion all over the picture, on the half tones and delicate shadows, as well as on the high lights, and unless there has been sufficient contrast produced by the iron, there is a risk of producing a tame, flat negative. Most intensifying processes used after fixing, have, on the other hand, a tendency to exaggerate the contrasts a little, giving the greater intensity in proportion to the high lights than to the detail in the shadows, and thus render, necessarily, an image in which universal detail is prominent, to begin with.

A weak iron developer requires more acid than a strong one. The reason of this will be readily seen on a little reflection. Long continued development with an iron developer has a tendency to produce a foggy deposit upon the shadows, and as a weak developer requires a longer time to do its work, it follows there is danger, unless sufficient free acid be present, of producing fog instead of intensity. Many operators are in the habit of working with a 5-grain solution of iron. In this case it is generally found desirable to add the acetic immediately before use, in order to obtain a full efficiency. We have seen some exceedingly fine pictures in which the proportion of iron was eight grains, and of acetic acid twenty minims. In all cases a slight excess of acid is better than insufficiency, as any deposit on the deepest part of the shadows is fatal to brilliancy.

A solution of protosulphate of iron loses some of its activity by keeping: oxygen is absorbed, and a portion of the protosulphate is changed into a persulphate. This change is at once marked by the solution becoming gradually of a reddish brown. Many operators prefer the developing solution in this condition as having much less tendency to fogging or surface reduction. Where this is the case less free acid needs to be added to the solution. If a stock bottle of a saturated solution of iron be kept, it may be diluted from time to time, as its age, the condition of the weather, and the kind of subject may demand. There are many advantages attending such a plan. We subjoin formulæ for different iron-developing solutions differing in character, but all giving good results :—

1.	Protosulphate of iron	5 grains
	Acetic acid (glacial)	5 minims
	Water	1 ounce.
2.	Protosulphate of iron	8 grains
	Acetic acid (glacial)	20 minims
	Water	1 ounce.
3.	Protosulphate of iron	10 grains
	Acetic acid (glacial)	30 minims
	Liq. Ammon. fort.	3 ,,
	Water	1 ounce.
4.	Protosulphate of iron	12 grains
	Acetic acid (glacial)	10 minims
	Formic acid	12 ,,
	Water	1 ounce.

Each of these developers will give the best results when freshly prepared.

5.	Protosulphate of iron	15 grains
	Acetic acid (glacial)	15 minims
	Water	1 ounce.
6.	Protosulphate of iron	50 grains
	Acetic acid (glacial)	30 minims
	Water	1 ounce.

The last-mentioned will work best when a month or two old, and No. 5 when a week or two old. Alcohol sufficient to make each flow freely must be added; the amount will be regulated by the state of the bath. When the solution is about to be kept before use the acetic acid should be added, but no alcohol until the time of use.

Some of the very finest negatives we have ever seen were developed with a solution made after formula No. 2, which is that used by Mr. Heath. Some equally good negatives we have seen developed by a solution made after formula No. 6, which was that generally used by the late Mr. Lacy. The condition of collodion and bath, and more especially the mode of intensifying, rendered each of these two different solutions just what was wanted for the circumstances.

It should be borne in mind that the use of an iron developer is by no means a guarantee that a soft picture will be the result, or that a short exposure will be necessary. With an old simply iodized collodion, highly coloured from free iodine, a long exposure may be required, and a hard dense picture may be the result of iron development, just as it may be of pyrogallic acid development. A bath in bad condition, from impure silver or other causes, will often give a coarse grey picture which no treatment would make into a good negative. On the other hand rapid and soft pictures may be produced by pyrogallic acid development; but in that case everything must be in the most perfect condition as to age and purity.

The great advantages to be derived from the use of a bromo-iodized collodion and iron development are, first, that under fair average conditions, and such a degree of purity in the chemicals as is easily attained, clean, soft, delicate, and brilliant pictures may be easily secured; and secondly, that these conditions may be uniformly maintained without reference to the ever-varying results of age, &c., which render it almost impossible with a simply iodized collodion and pyrogallic acid development to secure anything like uniformity, either in time of exposure or quality of result.

Notes and Jottings.

No. 10.

On the Combining Equivalents of the Iodides used in Collodion, and the different quantities of Iodide of Silver formed by the use of different Iodizers. Waste Silver dissolved out of the Film by the Fixer.

It is common in giving a formula for iodizing collodion to say add so many grains of an iodide, without reference to its base, thus overlooking the fact that a grain of one iodide by no means combines with the same quantity of silver as a grain of another.

Let us take, for example, the iodides generally used, namely, those of *ammonium*, *potassium*, and *cadmium*, we find that each grain of

iodide of ammonium	contains	·87	grains	iodine
,, potassium	,,	·78	,,	,,
,, cadmium	,,	·70	,,	,,

hence, taking the two extremes, 4½-grains of iodide of ammonium to each ounce of collodion, forms just the same quantity of iodide of silver as 5¼-grains of iodide of cadmium; potassium is just midway between these two, so that if we use half ammonium and half cadmium, the result would be as nearly as possible the same as using potassium only.

Whilst on the subject of collodion, we have made a short calculation of the quantities of silver dissolved off the plate by the fixing agent, and only too commonly thrown away.

Each grain, say, of iodide of potassium combines with a trifle more than a grain of nitrate of silver, or about ·66 grains of metallic silver, so that for every ounce of collodion used, rather over three grains of the precious metal, *or nearly the value of one half-penny*, is thrown down the sink!

Ounces of collodion quickly go, and we should find that at the end of twelve months, these half-pence saved would well repay for the slight additional amount of trouble. By simply using a dipping bath, or appropriating to this purpose a separate tray with a waste pipe to carry the portion of fixer used off into a bottle, to be subsequently filtered and used over again until saturated with silver, the additional labour involved would actually be *nil*.

We have here supposed that *all* the iodide of silver formed is dissolved off, and that the negative image is formed from the silver added to the developer. This, practically, is no doubt the case, little, if any, of the normal iodide of silver remaining with the deposit. Most collodions also form an organic compound with silver which has not been taken into account, so that we may look on it as a margin in our above calculation.

This is not, however, the direction in which the bulk of silver is wasted in the operating room; but, unless by actual experiment, it would be difficult to arrive at anything like an estimate of the value thereof. We purpose, however, through the assistance of a professional photographer, who has kindly placed the means at our disposal, to try such experiments, and to give the result to our readers at a future time. Michael Hannaford.

PHOTOGRAPHIC CHEMICALS;

Their Manufacture, Adulteration, and Analysis.

The salt of phosphoric acid most used by photographers is the ordinary phosphate of soda, containing two equivalents of soda, one equivalent of basic water, and one equivalent of c-phosphoric acid. This salt is prepared by adding to a boiling solution of phosphoric acid, obtained by either of the processes already described, carbonate of soda until no more effervescence takes place upon further addition of the carbonate. If the phosphoric acid has been prepared from bone ash, or if it contains earthy impurities derived from any other source, there will be a precipitate of phosphate of lime and magnesia; these must, therefore, be separated by filtration. The solution will still contain traces of lime and magnesia, and to separate these, a trifling excess of carbonate of soda must be added and the whole evaporated to dryness. Upon now re-dissolving the mass in cold water, the phosphates of lime and magnesia will be left behind undissolved, whilst the phosphate of soda will enter into solution: filter off the insoluble portion and evaporate the liquid over a sand bath until a drop removed on to a cold glass plate deposits crystals; upon then allowing the solution to cool gradually the salt crystallizes out in transparent, oblique, rhombic prisms.

Phosphate of soda so prepared contains 24 equivalents of water of crystallization, but is not permanent in the air, for upon exposure it effloresces and loses 10 equivalents of water, becoming converted into a salt containing 14 atoms of water. In any photographic experiments with this salt it is therefore necessary to remember this fact in calculating the quantities of phosphate used, as the former salt contains 6·66 per cent less phosphoric acid than the effloresced salt. Phosphate of soda (by which salt in ordinary language, is meant the diphosphate with 24 atoms of water) dissolves in 4 parts of cold, and two parts of hot water; it has a slightly saline, but not unpleasant flavour, its aqueous solution has the property of absorbing considerable quantities of carbonic acid, and when kept for some time in glass bottles it corrodes the surface of the glass. When added to nitrate of silver it precipitates a phosphate of silver containing three atoms of silver-oxide to one of phosphoric acid; two parts of the nitric acid originally combined with the silver uniting with the two equivalents of the soda, whilst the third atom of nitric acid with which the third part of the silver was united combines with the one equivalent of water which acts the part of a base, and thus communicates a strongly acid reaction to the liquid. Now, phosphate of silver dissolves readily in nitric acid, and, therefore, the employment of a salt, which gives rise to a separation of this acid upon precipitation is attended with considerable loss of silver. We therefore advise photographers in all cases to examine their phosphate of soda before experimenting with it, and if it turn out, as will most likely be the case, to be the ordinary variety containing only two equivalents of fixed base, to convert it into the triphosphate of soda. This examination can be easily performed; it is only necessary to add to an aqueous solution of neutral nitrate of silver a little solution of the phosphate of soda under trial, when, if the supernatant liquor after deposition of the phosphate of silver, is decidedly acid to test paper, the salt employed is the ordinary phosphate. To convert this into the tribasic phosphate (containing three atoms of base), make a strong solution of it in water, and then add to it at least half as much soda as it already contains. Evaporate the liquid down until a thin pellicle forms over the surface of the solution, and then allow it to cool. When cold, the tribasic salt will be found crystallized out, whilst the mother liquor contains the excess of caustic soda: drain the crystals in a glass funnel in which a glass rod is placed to prevent them falling through, then dry them between bibulous paper, and dissolve them in twice their quantity of hot water. Filter the liquid, if necessary, and set it on one side in a shallow dish to crystallize. It separates out in thin six-sided prisms, which are permanent in the air. They dissolve in five parts of cold water. The aqueous solution has a cooling and alkaline taste, and acts somewhat as if it contained free alkali, as it absorbs carbonic acid from the air, and by the action of this acid, as well as by that of other weak acids, becomes converted into the common, diphosphate of soda. It likewise expels ammonia from its salts. When mixed with nitrate of silver it precipitates triphosphate of silver (the same salt which the previous phosphate precipitates), and leaves the supernatant liquid perfectly neutral.

In addition to the common phosphate of soda there is another phosphate frequently met with—the phosphate of soda and ammonia, a salt in which the ammonia takes the place of one equivalent of the soda; it consists of one atom of soda, one atom of ammonia, one atom of basic water, and one atom of c-phosphoric acid. This salt is a very common one, but is not to be recommended for photographic purposes as it (like the diphosphate of soda) gives rise to a separation of nitric acid when mixed with nitrate of silver. It is, however, of considerable use in the laboratory as a blow-pipe flux, and as a knowledge of the simple blow-pipe reactions is of great advantage to the scientific photographer engaged in research, we think that a short outline of the principal facts connected with this salt will not be out of place. It is prepared by mixing five parts of crystallized diphosphate of soda, and two parts of crystallized diphosphate of ammonia together, after dissolving them in hot water. Upon cooling, the liquid deposits crystals of the salt in question. It may also be formed by dissolving six or seven parts of common phosphate of soda in hot water, and adding one part of sal ammoniac. The solution is then to be filtered, and allowed to cool, when the phosphate of soda and ammonia is deposited in crystals, mixed, however, with a little chloride of sodium. The salt crystallizes in large transparent and colourless prisms which have a saline, fresh and somewhat ammoniacal taste. When exposed to the air they effloresce on the surface, and evolve ammonia. When heated, ammonia and water are given off, and the simple metaphosphate of soda is left under the form of a transparent glass. In this state it acts as a powerful flux, and the salt is consequently much used in blow-pipe operations under the name of microcosmic salt.

The only other salt of phosphoric acid which the photographer is likely to meet with is the phosphate of silver. The precipitate which takes place upon adding either the ordinary phosphate (diphosphate) of soda, the triphosphate, or the phosphate of soda and ammonia to a solution of nitrate of silver is the triphosphate of silver, consisting of three equivalents of silver to one of phosphoric acid. When the phosphate, used as a precipitant, contains only two atoms of alkaline base, nitric acid is liberated, but if there be three atoms of alkali, the supernatant liquid remains neutral. In either case the precipitate carries down with it a little of the nitrate of silver which refuses to dissolve out on washing. The triphosphate of silver is a lemon-yellow powder insoluble in water, and when dry perfectly anhydrous; it becomes of a red-brown colour when heated, and fuses at a higher temperature into a dark brown liquid; on cooling the original yellow colour is resumed. Phosphate of silver is sensitive to the action of light, and has been utilised by Maxwell Lyte in a very beautiful and efficient printing process: this has considerable advantages over the chloride of silver process in respect to permanency, and has been used by us very frequently since the first publication of the process by the inventor. We are, therefore, in a position to speak of its merits, and propose, accordingly, to draw attention to some of its more valuable points in a subsequent article. The other properties of phosphate of silver are as follows:—It is readily soluble in aqueous solutions of phosphoric, nitric or acetic acid, in pure ammonia, or in carbonate of ammonia; less easily in nitrate of ammonia, and scarcely at all in the sulphate of ammonia. Upon evaporating the solution in nitric acid it seems to split up into nitrate of silver and phosphoric acid, the former crystallizing out, whilst the latter remains in the mother liquor.

PHOTOGRAPHY AND ITS STUDENTS.

BY SAMUEL FRY.*

Great Britain is, par excellence, the land of amateur photographers; they now constitute a very large and intelligent body. On the continent of Europe, and in America, although the art is largely cultivated as a profession, the numbers who practice it as a recreation or pastime are very small indeed, comparatively speaking. Now, although it would not be reasonable to expect that more than a per centage of amateurs should attain to excellence, yet the results obtained by them.

* Continued from page 543.

as a body, are of the very highest value, many of the brightest intellects of our day being devoted to the "black art."

Our professional photographers are, as a body, a higher class of men than seemed at one time likely to join the ranks, and the large patronage extended by a wealthy, if not very discriminating public, enables the majority of competent operators to do well, but there is a something wanting; our commercial photographers are evidently impressed with the belief that portraits are the only legitimate field for the art, and even then are almost confined to pictures of small size. On the other side of the Channel, however, there are large firms who carry on operations on an immense scale, whose cameras are yards each way, whose lenses are of dimensions altogether unknown here, whose baths are cisterns, and whose plates of glass are often 40 or 50 inches each way. We have all seen the magnificent results of such enterprises in the grand architectural studies exposed for sale in shop windows, which exemplify that whilst we are acquiring in our private circles, and discussing in our journals, the means of obtaining various desiderata, the French have long since achieved triumphs in these very directions. We exert all our energies to produce lenses which shall give architectural lines parallel on plates of a few inches each way, and yet years ago pictures were exposed for sale in London shops 25 inches each way, and displaying mathematical accuracy in their lines, besides possessing every attribute that a work of art should possess. Again, when Bisson Freres are engaged in taking their magnificent Alpine scenery their staff is composed of about twenty-five persons, and proportionate pains and expense are lavished in every department to enable them to keep up the high character of their works. Yet again, for how long have we discussed various dry-plate processes, and in what inextricable confusion have we been involved, by the publication of conflicting statements which could never be reconciled, and yet whilst we have been, from the large number of witnesses to be examined, detained in doubt and uncertainty, the question has been long settled elsewhere, as the large majority of the pictures just alluded to are done on collodio albumen dry plate. In fact, there are on the Continent, not only in France, but in Germany, Prussia, and especially in Italy, photographers who produce, in the ordinary course of business, pictures on dry plates such as *we* very rarely see. The object of this paper is to encourage photographers to take large pictures; there is great merit in size. In fact, there is a far larger amount of skill required to produce a fine picture of twenty inches square than is often supposed, whilst the commercial value of such productions is indisputable. We shall be called upon next year to compete with the photographers of the world; *we* have given the challenge. We have photographic societies, meetings, journals devoted to it, and an army of volunteer photographers. I assert, in the most uncompromising manner, that the works coming from abroad will astonish us not a little, both in their size and quality, and if we are not sharp we shall lose the day. It would be utterly ridiculous, worse than useless, to fill up one available space with portraits of the conventional stereotyped class. We want higher flights than this, and must not be misled. The ordinary run of large landscape will stand but little chance, the subjects must be very grand, the composition artistic, and the *toute ensemble* of the highest possible character, to compete with our *confrères* from over the water in 1862.

ON SIMPLE DRIED COLLODION WITHOUT A PRESERVATIVE AGENT.

BY W. HISLOP, F.R.A.S.*

Although the various processes for the preserving of surfaces in a state of sensitiveness to light are so numerous, it can hardly be asserted that we have yet attained perfection. Exquisite pictures have occasionally been obtained by almost every process; and yet we are continually hearing of something fresh, or some revival of something old—some new preservative, or some new method of manipulation, is announced as perfection and as simplicity itself. A pamphlet is written, and it comes forth to the public so full of details and precautions as to makes its utility doubtful to those whose aim it is to get *pictures*, and not the pleasure of preparing plates.

The proper line of direction seems now to be to simplify details, and, with the materials which we possess, to endeavour to shorten the manipulation as far as possible.

It may probably be thought to be going too far to say that we have been experimenting in a wrong direction, in devising all sorts of applications to the plate to preserve it; still I have no doubt in my own mind that it will ultimately be found that the effect of these applications has only been to mar and spoil an exquisitely delicate surface, which requires rather to be kept from contact with any extraneous substances whatever.

It has long ago been stated that the dried collodion film is sensitive to light; but the statement has been made in so doubtful a manner, and with such qualifications, that few have ventured even to try the experiment. Among other things, it has been said that the pores of the collodion must be kept open, in order to allow the developing agent to penetrate the film and bring out the picture. Then various substances have been applied to its surface, and in most cases carefully washed off again. and we are told that some mysterious effect has been produced on the film, which enables the desired result to be obtained. Recently we have had several processes in which the great difficulty is the non-adhesion of the film to the plate, rendering some previous operation necessary for keeping it fast. Major Russell, advocates the general use of some such means, as he asserts, and truly so, that it is desirable in all dry processes.

Now, it is a simple fact, and that without any qualification, that no preservative substances whatever are required: good pictures can be got without them. If the film be excited in the ordinary way, well washed and dried, it will be found sensitive still, and as sensitive as the best of any other dry process. More than this, it will be found perfectly easy to develop the picture. It comes out quickly and with ease, and is perfectly under command. The results will be found very similar to those which would be obtained with the same collodion in a wet state, except that there is a slight loss of intensity. If a small quantity of common resin—say half-a-grain or a grain to the ounce—be previously added to the collodion the intensity will be very materially increased, and for transparent positives a very beautiful colour will be obtained.

One great point, I find, is to keep the sensitising bath very acid with *acetic acid*. The only other precaution is to adopt some means of keeping the film on the plate. This may be done either by painting the edge with varnish or covering the surface with gelatine or albumen. I much prefer albumen. I simply add the white of an egg to eight ounces of water, with about half-a-drachm of glacial acetic acid, shake the whole well together in a bottle, let it stand a few hours, filter it, and bottle it for use. The quantity is sufficient for a very long time, as it is simply poured on and off again into the bottle—if necessary, helping it to spread with a glass rod. The plate is then dried before a brisk fire, put by to cool, and then the ordinary manipulation is followed.

I prefer washing in a series of dishes, pouring over the plate, when taken from the last dish, a gentle stream of water to remove any particles which may have settled upon it. The plate is then dried spontaneously, and stored away for use.

I have tried several sorts of collodion, and find the same especial results. The qualities of each sample come out on the dried plate in the same way in which they are apparent in the wet state.

Let it be understood I claim nothing as new. I only know that, after years of labour and failures, I have at length

* Read at a meeting of the North London Photographic Association, November 20th, 1861

found a method of getting pictures which supply my wants. I know beforehand that if I can get a good picture with the collodion in a wet state, that I shall get the same results, or even better, in a dry condition. I speak advisedly when I say *better* results; for the amount of detail which I have thus got in my dry negatives could never be obtained with the same material in a soft spongy condition.

Dictionary of Photography.*

Sandarac.—A resin which forms the basis of most spirit varnishes. It is sold in small yellowish brown drops, called "tears," and is entirely soluble in alcohol. In combination with shellac it forms an excellent spirit varnish for negatives.

Sea Water.—Containing all the salts which by combination with silver form sensitive compounds, it is not surprising that sea-water should have been suggested for preparing paper instead of the ordinary salting solutions. The proposition has never been carried into effect to any extent, nor with any palpable advantage, one of the chief difficulties consisting in the fact that sea water is an uncertain and variable compound, a variety of local causes affecting its exact composition. The analysis of the water of the English Channel, as conducted by Dr. Schweitzer, of Brighton is as follows:

1000 grains contain—

Water	964·745
Chloride of sodium	27·059
" potassium	0·766
" magnesium	3·666
Bromide of do.	0·029
Sulphate of magnesia	2·296
" lime	1·406
Carbonate of do.	0·033
Traces of iodine and ammoniacal salt	
	1000·000

Sel d'or.—The double hyposulphite of gold and soda, used for gilding Daguerreotypes, and in some toning processes, for paper prints. The solution is formed by dissolving one grain of chloride of gold in an ounce of water, and three grains of hyposulphite of soda in another ounce of water, and then mixing the two. Great care is required in this operation: the solution of gold must be added to the solution of hyposulphite of soda, stirring the solution at the same time. If the contrary course were followed, and the hyposulphite solution added to the gold, the latter would be at once precipitated. Sometimes the proportion of four parts of hyposulphite of soda is added to one of gold. The commercial sel d'or is sold in white needle-like crystals; it is precipitated from the solution above described, by the addition of alcohol. Commercial samples are often largely adulterated.

In the Daguerreotype process, the plate, after fixing with hyposulphite of soda and well washing, is covered with the solution of sel d'or, and the flame of a spirit lamp applied underneath. In a short time the plate is covered with small bubbles: it not unfrequently happens that the plate at first begins to assume a clouded appearance, but on the continued application of heat all this disappears, and the picture assumes a richness, brilliance, depth, and purity of tone far superior to what it possessed before. It is then to be rinsed with distilled water, and dried carefully by the aid of the flame of the spirit lamp. Care should be used not to apply too great a heat, nor continue it too long, as exfoliation, or the cracking and flying up of the deposited layer of gold in thin leaves may ensue. This process of gilding is not only a great improvement to the appearance, but affords an effectual protection to the picture.

The sel d'or toning process for positive prints is chiefly applicable to plain paper, and is not usually successful when applied to albumenized paper. The prints are to be immersed in a solution containing one grain of sel d'or to five ounces of water, or, if made impromptu, two ounces of the solution above described added to sufficient water to make a pint. A few drops of hydrochloric acid are generally added. The time of immersion will be regulated by the tone required, but a few minutes will generally suffice. When deep enough the print is to be thoroughly washed in several changes of water to remove all trace of acidity, and then fixed in fresh hypo. The sel d'or bath should not be used again. This bath is still used by some operators, but is gradually being superseded by the alkaline gold toning process. It is maintained by some that the sel d'or process does not necessarily involve any sulphur toning action, and that if properly conducted the prints are perfectly permanent. It is a safe precaution to wash the prints in a water slightly alkaline before immersing in the fixing bath, and by that means preventing the danger of leaving any trace of acid which might decompose the hyposulphite of soda.

Sepia.—A rich warm brown pigment, obtained from a secretion of the cuttle-fish. Drawings in monochrome with this pigment used to be much in vogue. The tint is an excellent one for photographers, especially landscape photographers, to aim at in toning their prints. The pigment is valuable for "re-touching" photographs.

Serum of Milk.—This substance has been proposed for, and used in, several photographic processes. It has been used in connection with the salting bath for plain paper, in order to retain the silver on the surface and give vigour to the print. It has also been proposed as a preservative to the collodion plate in the Fothergill process, in place of the albumen solution. It is procured by adding a little rennet to skimmed milk, and allowing it to stand in a warm place. The curd is then removed, and the resulting whey or serum preserved for use. It is more generally procured for photographic purposes by adding lemon juice to skimmed milk. A tablespoonful of lemon juice is added to a pint of the milk, which is boiled, and then strained to separate the curd. To the liquid thus obtained the desired portion of chloride is added, and the solution used for salting the paper. Mr. Sutton, who has frequently advocated the use of serum of milk for this purpose, says it gives richer blacks and purer whites than any other similar preparation.

* Continued from p. 474.

A FEW WORDS ABOUT PHOTOGRAPHY.*

Of all the delights that science has bestowed upon mankind, surely the most charming is photography, in its varied phases and universal range! The wonders and pleasures of the telescope and microscope are restricted to a comparatively limited number, and require more or less of scientific education rightly to appreciate their marvels. Photography, with a more liberal hand, bestows its treasures on all comers —from the learned Professor, gloating over the exquisite delineations of glaciers from the remotest valleys of the Alps, or the geological strata of some cliff face in Central Africa, which the labours of enterprising photographers have laid on his library table—to Private Jones of the Militia, who exchanges portraits (price 6d. coloured, frame and glass included) with the maid-of-all-work who has captivated his martial soul. Is not this a popular science.

From the conquests already achieved by this young child of science, it is difficult to assign any limits to the range of photography. Some one has lately been taking photographs at the bottom of the sea, so that we may shortly have a "Gallery of Portraits of Remarkable Fishes," taken at their own marine residences; and, on the other hand, photographic portraits of the moon have long been familiar to us, and have had the effect of correcting the erroneous impressions formerly entertained of the personal appearance of that much esteemed luminary, derived from public-house signs and children's picture-books, by no means flattering in point of beauty, nor correct in a scientific sense. Granting, therefore, that it is a long way from the moon to the

* From the *National Magazine*.

bottom of the sea, our position that the range of photography is somewhat extensive will be readily admitted; and, by the aid of the balloon in one direction, and the diving-bell in the other, fresh discoveries may be constantly expected.

Very rapid, certainly, has been the progress of photography. We can all remember the wonder and delight with which the early efforts of Fox-Talbot, Daguerre, and others were welcomed; and we have a very vivid recollection of those extra-*ordinary* portraits, about two inches square, at a guinea each, that could only be seen with great difficulty in one particular light, and then were so hideously ugly that you felt rather thankful that they were mostly invisible. Now, what with "Pistolgrams of Babies," *Cartes de visite*, &c., &c., &c., a man is fortunate who escapes with having his likeness taken not more than once a year: and as for remarkable persons about whose *physique* the public are solicitous, they must spend a considerable portion of their lives in undergoing this pleasing operation; and we suppose they are waylaid on all occasions, and dragged off to the dens of photographers, and there, with a pistol at their heads, compelled to put on their most benevolent aspect for the process.

Science has great cause for gratitude for the perfect records of her operations supplied by photography, and the camera and its apparatus are now considered indispensable to scientific expeditions. On the occasion of the total eclipse of the sun, the year before last, when the gigantic *Himalaya* loaded a "full and complete cargo" of philosophers to proceed to Spain to witness the eclipse from the central point, great preparations were made for recording the various phenomena by means of photography, and marvellous and beautiful were the results obtained.

Commerce, too, makes large demands on the services of photography. House-agents give you pretty views of the houses they have to dispose of; machine-makers, engine-builders, sculptors, and many others who require accurate delineations, now substitute photography for any other kind of drawing. For presenting a faithful record of the progress of large works it is invaluable. We were, a few days ago, in the office of one of our large contractors, who is making a railway in some remote portion of the globe, and, wishing to refer to some part of the works, he whistled and grunted through a flexible tube that hung at his elbow, and a clerk appeared with a huge book, which appeared to be full of photographs of the works on the line, pasted two on a page, the dates attached to each, forming a complete and accurate record of the progress of the works. Very beautiful photographs they were, and very curious in the minuteness of the detail: better than any series of reports were these pictures, unimpeachable in their integrity. It was no use Mr. Resident Engineer describing all things going on swimmingly, when the photographs accompanying his letter shewed an ugly swamp which swallowed up their earthworks as fast as they were made, shewing weeks of fruitless labour: quite useless to report that such a station was finished, or such a bridge completed, whilst the incorruptible camera told a different tale. We found it was now a very usual practice for a photographer to accompany the staff on works of any magnitude.

So much for the useful; but what shall we say for the beautiful? Adjectives fail us. Look at those beautiful pictures of Bissons Frères, of Alpine scenery, giving the very texture of the snow, sullied by the summer thaw, and furrowed by the fierce blasts that sweep the ravines, and assist the sun to free those cold, dark peaks of granite, from their winter thraldom. How hard and defiant they look during their short escape! There is absolute sublimity in these small pictures, from their unerring truthfulness, which no painting or description can approach. Or those equally magnificent Egyptian scenes of Frith's, where you seem to feel the intense heat of the sun that casts that sharp black shadow from colossal gateway or ruined porch, over the burning sand, and admire the enthusiasm that led Mr. Frith over those hideous wastes of sand and granite, where the photographic tent became an oven in temperature, and the "collodion boiled upon the plates." And for the result of his labours, we have on our drawing-room tables a handsome volume of the ruined treasures of Ancient Egypt and the Upper Nile—the mountain scenery and the noble cedars of Lebanon, and the crags and peaks of Sinai and Ararat. Then, again, we have those lovely sea-pieces of Gustave Le Gray, where the curl of the breaking wave, or the shadow of the passing cloud, have been arrested by the instantaneous magic of the camera, and presented before us, in such wondrous beauty. Then Roger Fenton and many others spend their summer days (and what a charming life it must be!) amongst the choicest nooks and corners of English scenery, and their lovely pictures are scattered broadcast over the land.

Architecture, too, draws largely on the science; and Rome and Venice, Florence and Verona, Rouen and Amiens, Ghent, Brussels, Cologne and Heidelburg send us charming pictures of their great masterpieces; whilst in our own country there is scarcely church or castle, tower or hall, of any pretensions to architectural merit or picturesque beauty, that has not been made familiar to us by photography. And what a pleasure there is in these pictures—what a charm in the feeling of their absolute truth and of their completeness! You can take a powerful magnifying glass and examine a first-class photograph, say of an old Italian cathedral, till you can see the moss and lichen, and the fantastic tooth-marks of old Time on the gateway stones; or, in the interior, detect the dark circle round the font, or the path to the high altar, worn by the countless steps of many generations of pilgrims. All that the original contained *is there* if you could only see it, and the beauties of a fine photograph continually increase on examination, and every effect of light and shade, atmosphere, perspective, and even chiaroscuro, are represented with a fidelity of effect that in many points leaves all painting at an unapproachable distance.

AFFINITY OF IODINE, BROMINE, AND CHLORINE FOR SILVER.

BY FREDERIC FIELD.*

Although both bromide and iodide of silver are decomposed by the action of chlorine at an elevated temperature, yet chloride of silver is completely decomposed by bromide of potassium, and both the bromide and chloride of silver by iodide of potassium. Even the action of hot strong hydrochloric acid has but little influence upon the iodide of silver; many days of continuous boiling are necessary for its entire decomposition. I believe that it has been the opinion of chemists that chlorine possesses an affinity for silver superior to all other elementary bodies, and we are told in Gmelin's Handbook that all salts of silver, even the insoluble ones, are converted into chloride by solutions of metallic chlorides. From the following experiments it appears to me that bromine has a greater affinity for silver than chlorine, and iodine a still greater affinity than bromine.

When a mixed solution of bromide of potassium and chloride of sodium is added gradually to a solution of nitrate of silver, not in excess, no trace of chloride of silver is precipitated, as long as any bromide remains in solution.

If to a similar solution, iodide and bromide of potassium and chloride of sodium be added, iodide of silver and nitrate of potassa are formed, the bromide of potassium and of chloride sodium remaining undecomposed.

When bromide of potassium is poured upon chloride of silver, an entire decomposition ensues, bromide of silver and chloride of potassium being produced.

When iodide of potassium is added to chloride of silver, iodide of silver and chloride of potassium are formed; and when iodide of potassium is added to bromide of silver, there is a similar decomposition, the iodine replacing the bromine.

When chloride of silver in excess is agitated with a solution

* "On the Separation of Iodine, Bromine, and Chlorine, and the Comparative degree of Affinity of these Elements for Silver; with some Analyses of their Combinations with that Metal occurring in Chili." By Frederic Field, Esq. Communicated by Dr. Hofmann, F.R.S., to the Royal Society.

of iodide of potassium and warmed for some hours, no trace of iodine can be detected in the solution: when, however, chloride of sodium is poured upon iodide of silver, no decomposition occurs, neither is there any action upon bromide of silver with the same salt: and when bromide of potassium is added to iodide of silver, there is no alteration in the union of the elements.

From a number of experiments made in illustration of the preceding statements, I deemed it possible that the separation of chlorine, bromine, and iodine, could be accomplished by this reaction.

The method which I have devised is simply this:—After weighing three equal portions of the salts to be analysed, they are placed in three flasks, with ground-glass stoppers, and about an ounce of water is added to each; nitrate of silver being then added, slightly in excess, to the three, the stoppers are replaced, and each flask agitated violently. The precipitates subside in a few minutes, leaving the supernatant liquid perfectly clear. They are then filtered through separate funnels, and washed with hot water. No. 1 is dried and weighed. No. 2 is digested in bromide of potassium, dried, and weighed; and No. 3 in iodide of potassium, dried and weighed.

To test the method, a mixture was made of 5 grains of iodide of potassium, 5 grains of bromide of potassium, and 5 grains of chloride of sodium. The following is a comparison of the theoretical and experimental results:—

	Experiment.	Theory.
Iodine	3·69	3·81
Bromine	3·51	3·34
Chlorine	2·92	3·02

I have availed myself of this method in analysing several silver ores containing chloride, bromide, and iodide of silver found in Chili, the formulæ of which I subjoin:—

Chloride of silver	... Ag Cl.
Chlorobromide of silver ...	... 2Ag Cl, AgBr.
Chlorobromide of silver ...	... 3Ag Cl, 2 AgBr.
Chlorobromide of silver ...	... Ag Cl, 3 AgBr.
Bromide of silver	... Ag Br.
Iodide of silver	... Ag I.

Proceedings of Societies.

London Photographic Society.

The usual monthly meeting of this society was held on the evening of Tuesday, December 3rd, Henry White, Esq., in the chair.

The minutes of a previous meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Messrs. Greenwood, Cole, Tant, Montefiore, Hewitt, and Castleman.

The Chairman said in accordance with the seventh rule of the society, he would now read the names of the retiring officers, and those nominated by the Council for election in their places at the annual meeting to be held in February. Should any member desire to propose other gentlemen for election it would be necessary to do so at, or previous to, the next meeting to be held in January. The retiring Vice-President was Professor Bell, and Mr. F. Bedford was nominated by the Council as his successor. The members of the Council retiring were Messrs. Crace, Maskelyne, Stokes, Delamotte, Bedford, and Dr. Fane; in their places the following gentlemen were nominated:—Messrs. D. Wright, Vernon Heath, Glaisher, Joubert, H. P. Robinson, and Professor Sedgwick.

The Secretary then read a letter received from Mr. Brown, Secretary of the Birmingham Photographic Society as follows:—

"*Birmingham Photographic Society, Dec.*, 2, 1861.

"Dear Sir,—I intended being present at your meeting tomorrow evening, with some of Mr. Breese's stereograms, particularly his views of the moon, but at the last moment am prevented. I should have been more annoyed at this delay, but I hope ere another meeting of the Society to be enabled to lay before the members a view, or views, of the moon taken either by myself, aided, of course, by the appliances of Mr. Breese, or by Mr. Breese in my presence. Although I have no doubt in my own mind that the pictures are what it is pretended they are, viz., views of the moon and clouds, taken by the light of the moon at midnight. In one case through an open window of a room, at which sits a lady whose features are not more than a silhouette, though the lace sleeve, and ornaments upon the table, upon which she rests her arm are distinctly rendered in every detail. Still I wish to remove any shadow of suspicion that may attach to Mr. Breese in consequence of his being so backward in explaining the means by which he produced them; but when I tell you that he is an amateur, and has spent a very large amount both of time and money in bringing his ideas to perfection (though he does not so think them), I do not think that he is called upon to lay his ideas before the world without any recompense. He has a very strong objection to give any explanation whatever until he has completed his experiments, and this is the main ground for his remaining so quiet upon the subject, coupled with his generally unobtrusive manner. The question of their being instantaneous I have disposed of in my reply in the *British Journal* to the remarks of Mr. Cramb, of Glasgow. Regretting not being able to make your acquaintance to-morrow evening, I am yours faithfully,

"Jno. T. Brown, *Hon. Sec.*

"H. Diamond, Esq., M.D."

Mr. Vernon Heath wished to put two short questions to the Chairman which he had no doubt would be very easily answered. One had reference to an answer in the last number of the society's *Journal*, regarding the annual exhibition of the society. He thought desirable that it should be distinctly understood whether the ordinary exhibition of the society would be held at the commencement of next year or not. His second question had reference to the International Exhibition to be held next year. He thought the time had come when they ought to know definitely what had been done by the society in reference to this matter; and in what position photographers would stand in relation to the Great Exhibition of 1862.

The Secretary said, the Council had considered the subject of their ordinary annual exhibition, and had come to the conclusion that no such exhibition should be held in the coming year (hear, hear). Regarding the International Exhibition of 1862, the members of the society were already familiar with the correspondence and its results. Since then the Commissioners had sent circulars to various gentlemen, asking them to act in a committee for the management of the photographic department. He (Dr. Diamond) had received one of those circulars, and had at once waited upon the Chief Baron, and taken his advice on the subject as to how he should act. The Chief Baron asked, with whom he was to be associated, and on learning, he stated that he thought it was desirable—now that the society had made their protest against what they conceived was an improper classification—that they should aid the exhibition to the best of their ability (hear, hear). He might now announce therefore that the committee would be formed by the Earl of Caithness, Mr. Kater, and himself (Dr. Diamond), and that Mr. Le Neve Foster would be the superintendent.

Mr. Heath asked if these gentlemen constituted the whole of the committee, or merely all as yet appointed.

The Secretary believed that it was complete.

Mr. Heath said as it was now too late to discuss what ought to have been done, but since a committee was appointed, he thought that photographers generally should give the best aid they could in any way; and if it was still thought desirable to add to the number of the committee, the best persons from other societies, as well as this, might be induced to act, so as to secure to photography the best possible representation, and all pull together for a successful result at the coming Exhibition.

The Chairman remarked that there were 250 applications for space in the photographic department; and 2,400 square feet of space applied for.

Mr. Heath understood that 2,300 square feet were applied for by one person.

The Secretary remarked that that application was for counter room to exhibit apparatus.

Mr. T. Ross then read a paper on the panoramic lens. At the termination of which he exhibited the apparatus and showed a number of very fine negatives; one of his assistants also showed the facility with which curved plates could be coated with collodion.

The Chairman asked if it was possible to flatten the glass after the negative was taken, and so print from it flat.

Mr. Ross did not think it could be done, nor did he think it was necessary. If the chairman would examine the printing frame provided he would see that the printing was very easy. It had been suggested that the film might be removed so as to print from it when flat.

The Chairman remarked that removing the film was a difficult and a dangerous operation. He asked Mr. Bedford's opinion of the apparatus.

Mr. Bedford said this was the first time he had seen it.

Mr. Ross stated, in answer to a question, that the glasses exhibited, 9 by 5, were 18s. a dozen.

Mr. Shadbolt then read a paper on washing prints, in which he urged the importance of draining the prints thoroughly between each washing, so as to get rid, each time, of as much as possible of the former water, and thus avoid adding dilute hypo to each fresh dish of water.

Mr. Vernon Heath said he was happy, without knowing anything previously of Mr. Shadbolt's views in this matter, to be able, in all respects, to confirm his remarks, and to concur most heartily in the statements regarding the advantages of such a mode of washing. He would be happy to show any gentleman who might wish it, the system in operation. It was, he conceived, founded on reason, it proved most efficient in practice, and he believed it was an actual saving of time. He used the American clips which Mr. Shadbolt had referred to. Betwixt each change the print was laid on a plate of glass, which was placed under a tap at angle of 45° and well washed. The water in which they were placed was changed every ten minutes, and they were left to drain, between each washing, for twenty minutes. By that time the draining was very complete, so that the print contained no more of the washing water than just kept it damp. He believed that three or four hours washing of this kind would be much more efficient in removing all traces of the hyposulphite than any number of hours in which the changes of water were made without these precautions. A gentleman had that day told him of a plan he adopted; he had a large perforated box made for the prints, and this was sunk in a river, so that the stream might continually pass through. It was his (Mr. Heath's) opinion that this would be altogether inefficient, as the prints sticking together would effectually prevent perfect washing. He believed if the plan of perfect draining between each washing were tried, it would be found that the trouble was really less, whilst the results were incomparably more satisfactory.

Mr. S. Davis referred to the method, which he practised, of washing the prints when they have left the printing-frame, which was similar in principle. Instead of immersing the print in the water, he merely laid it upon it, so that the free nitrate of silver was gradually dissolved and dropped down into the water. He found that the free nitrate might thus be removed from the print much more readily than by any other method.

Mr. Martin said it had occurred to him whilst listening to Mr. Shadbolt's remarks on the importance of getting rid of the hyposulphite, and the difficulty of finding a sufficiently delicate test to decide when it was all removed, that the addition of acid to the final washing water, followed by the nitro-prusside of sodium would produce a very definite reaction if sulphur were present. He referred to Mr. Williams as to how far this might be regarded as a satisfactory test.

Mr. Williams said the nitro-prusside of sodium was a test only for sulphides.

Mr. Martin said he had suggested the addition of acid for decomposing any hyposulphite, and liberating free sulphur.

Mr. Williams said this would not produce a sulphide, and the test was valueless otherwise. He might here mention a plan of washing, which was adopted by one gentleman very successfully. The prints after each washing were placed between clean blotting paper, and then subjected to a heavy pressure with rollers, which squeezed every drop of moisture out of them. Three repetitions of this treatment was considered sufficient, and better than a week's washing without such treatment.

The Chairman thought that this would be a somewhat expensive method, as the blotting paper could not be used for the same purpose twice.

The Secretary referred to the spoiling of some prints from the accidental use of blotting paper, which had served such a purpose. He remembered that Count Montizon, whose pictures, he believed, had generally turned out permanent, was in the habit of laying his pictures on plate glass during the process of washing, and between each water dab them with a tuft of cotton wool until they were dry.

The Chairman expressed a conviction that it was not always imperfect washing which caused prints to fade, but some action which was set up in the fixing bath. He did not think, therefore, that a trace of hyposulphite of soda, left on the print, would necessarily cause fading.

Mr. Shadbolt said it was not hyposulphite of soda, so much so as hyposulphite of silver, in the print, the decomposition of which was the cause of yellowness and fading.

After the usual votes of thanks the meeting terminated.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 4th December, 1861.

M. Baudrimont gives, as the result of his researches upon the chemical action of solar light, that—contrary to the opinion generally entertained—chemical rays exist throughout the whole extent of the solar spectrum. The facts observed also lead to the belief, that each species of coloured light possesses a special action, and that each may be completely inert with regard to certain matters; but, on the contrary, very energetic with respect to others. Another series of experiments enables M. Baudrimont to establish the influence of the various colours of the spectrum upon the development of vegetation. Thus, for instance, no coloured light permits vegetables to go through all the phases of their evolutions; none of them have flowered or fructified. Violet coloured light is positively injurious to plants: they absolutely require white light.

M. Béchamp has published a summary of his researches upon xyloïdine, and upon some of the new nitric compounds of fecula. He shows that the xyloïdine of Braconnot is a mononitric derivative of fecula: that the latter can engender a second nitric combination richer than the first in nitric acid; that all these products can regenerate soluble fecula, and that we must regard them as combinations in which the molecule of fecula is united to molecules of nitric acid in the same ratio as in nitric ether or in nitrate of potash.

A very important fact in connection with sanitary science and with physical geography has been made by the illustrious agricultural chemist, Boussingault. He lately read before the Academy of Sciences a paper in which he demonstrated, with remarkable precision, that oxide of carbon accompanies the liberated oxygen, whenever the sun shines upon a vegetable submerged in water impregnated with carbonic acid. The presence of so deleterious a gas as carbonic oxide in the atmosphere of marshy countries is manifested by this discovery, and it explains the fatal attacks which animals suffer in the health when exposed to the influence of marshy exhalations.

On the other hand, it is maintained, that in large cities were coal is consumed, as in Paris and London, carbonic oxide is much more abundant in the atmosphere than it is in the most unhealthy marshy situations, and yet marsh fevers do not prevail in those cities. This has led to the conclusion that the cause of marsh fevers is due to a solid organic body, a microscopic insect, or the *débris* of an insect carried through, and penetrating the air-passages of, the lungs, and acting like a putrid foreign body which vitiates the whole mass of the blood in the animal by a process of putrefactive fermentation.

M. Ville, who has for some time past been carrying on a series of elaborate investigations upon the efficacy of certain soils upon the development of plants, measures the results with mathematical precision by means of photography in the following manner:—When two or more plants sown upon the same day, but developed under the influence of different fertilizing agents, have arrived at a certain stage of growth, M. Ville takes photographs of them upon the plate which at the same time gives copies of a scale composed of squares, each one decimetre in length and breadth, against which each plant measures itself; thus, at the first inspection of the photographs, it is easy to arrive at an exact appreciation of the superiority of one fertilizing agent over another.

The use of albumen, or whites of eggs, has been greatly extended in the arts of late years, but as only a moderate demand existed for the yolks, it has been the subject of much interesting inquiry to know how to dispose of them profitably. M. Edmond Sichel has suggested a useful application of the yolk of egg. The first step was to find a solvent for it: after many researches, glycerine was found to possess the desired properties. Yolk of egg dissolved in it yields a limpid yellow liquid. This solution has received the name of *glyconine*, and is found useful in medicine, replacing the oil of eggs (a preparation very difficult to form), employed for scratches and excoriations. The yolk of egg is concentrated by endosmose; it is put into a bladder, which is placed in a vessel containing a supersaturated solution of salt: in the course of a few days it is deprived of its water.

M. Dubois, one of our most eminent photographers, renowned for his excellent glass postives, has brought into notice a method of obtaining pictures on varnished cardboard, invented by M. Merricune, which advantageously replaces silver plate and glass plates in positive photography.

First, as to the nature of these new plates; they consist simply of thin and flexible cardboard, covered with several coats of hard black varnish, smoothed and polished by the ordinary methods employed by carriage builders and others. This manufacture is capable of being carried to great perfection: but already card plates are produced which are impervious to moisture, unacted upon by the several photographic solutions, susceptible of receiving all the necessary preparations, and upon which the collodion spreads with the greatest facility. The chief merit of these cards consist in their taking an extremely fine polish, from whence results a harmony of tones in the proofs, with a vigour and sharpness unattainable upon glass or paper. The cost of these new plates is inconsiderable, and their manufacture is undertaken on a scale sufficiently extensive to supply any reasonable demand; and thus we have at command a useful process, from which skilled operators may derive considerable advantage.

The method of operating with these varnished cards is exactly the same as that adopted for glass positives. The card plates are collodioned, sensitized, and exposed, then developed with a solution of iron, and fixed in the usual manner.

The superior lightness of the varnished card over glass will recommend it to the attention of the travelling photographer. Instead of obtaining uncertain negatives on glass, he will prefer to obtain a perfect positive of a view on the spot; for if an imperfect result should arrive, the work can be recommenced immediately upon the same card; for by passing a sponge over it, everything is removed. If subsequently it is found desirable to multiply copies of this positive, nothing can be easier, as it may be copied as readily as a picture or an engraving.

When the positive proof obtained upon the varnished cardboard is completely dry, it is perfectly solid: it would be necessary to scratch the surface, so as to remove the varnish, to efface the picture. Thus the fear of accident by breaking the glass through clumsiness or accident, to the ruin of the prized work of art, no longer need exist; the card may be bent without breaking, and this is certainly not the least of its recommendations. There is, however, another which is worthy of notice, the pictures on cards can be cut to fit into brooches, rings, &c.

But, perhaps, the chief merit presented in the new method is the perfect delicacy of detail in the image, the sharpness of the outline, and the transparency in the shadows, seldom, if ever, attained in pictures on glass: thus they possess all the delicate qualities so much admired in the Daguerreotype, without the intolerable mirror-like reflection of the latter.

By the convenience of transport, lightness of material, the rapidity of the operations, and the facility with which proofs can be taken during travelling, this process is particularly applicable to military photography, and will, doubtless, be largely applied on future occasions of reconnoitering.

The success of this method, as we have before stated, will depend upon the fineness of the polish given to the surface of the cards. As this can hardly be accomplished by hand, the mechanical polishing machine invented by M. Richardin will render the desired service.

[If we rightly understand our Paris correspondent, there is nothing new in this invention of M. Dubois. Several similar methods have been practised; and the "Niellotype" of the American operators appears to be identical with the process now described.—Ed.]

TONING AFTER FIXATION.

Sir,—When lately in Paris, I asked at M. E. Chevalier's, for the latest work on photography which had been published there. A small volume of the "Encyclopedie-Roret," was given to me. It is by M. E. de Valicourt. I have not had time to examine more than his directions for printing; they differ so much from the system adopted in this country that I think it may be interesting to give a summary of them. They are as follows:—

1. After exposure wash well, keeping the print in movement.
2. Fix in hyposulphite of soda—75 to 500 of water—leave it in from fifteen to twenty minutes.
3. Wash thoroughly so as to remove completely all trace of hypo.
4. Tone in a bath of neutral chloride of gold—1 to 800 of water—he states that after an immersion of some minutes the print becomes a deep red, then dark brown, and at last an intense dark violet.
5. Wash, &c.

I have never tried the system of fixing and thoroughly washing a print before toning, therefore offer no opinion on M. de Valicourt's recommendations, but if they are correct, they give this advantage. You will be certain of the ultimate colour of your print. Whereas under the system, as recommended by you, and I think all our English writers on photography, viz., toning first, and then fixing, there is always some uncertainty. It is difficult to retain the beautiful tone of the print, as it leaves the toning bath, after a sufficient immersion in the hyposulphite.—I am, sir, your obedient servant, N.

November 30th, 1861.

[If the toning of prints could be conducted successfully after fixation, some trouble and vexation would be avoided. Some years ago we made some experiments in this direction, but without very satisfactory result. We found it was almost impossible to tone an albumenized print at all after fixing. Fixed prints on plain paper were toned with less trouble, but a very strong gold solution and somewhat prolonged immersion was necessary. We are now speaking from memory, as the notes made on the subject are not at hand; but we came to the conclusion that the advantages were not at all commensurate with the trouble. Probably M. Valicourt refers to prints on plain paper. Regarding the loss of colour in the fixing bath, we know many first-rate photographers who tone with the alkaline gold bath, are in the habit of adding a little neutral chloride of gold to the hypo bath, to satisfy, as it were, its appetite for gold, and prevent it attacking the tone of the print. This is very like using hyposulphite of gold. It is argued that when the bath has toned a few prints the result is the same as if gold were added direct. After all that has been written on the subject of printing, toning, and fixing it is in a sad state of uncertainty.—Ed.]

A SUGGESTION FOR SECURING PERMANENCY.

Sir,—I have received the following statement from so trustworthy a source that I have no doubt of its accuracy.

Captain H—— returned from India, a short time ago, bringing with him a collection of photographic views taken there by himself.

My informant, himself a good photographer, assures me, that although they have been carelessly kept—much exposed to light and damp—the prints retain all their original freshness and purity of colour; yet they were taken and printed under great difficulties. The station, where Captain H. was quartered, was in some part of India where the heat in his tent was so intense, that the mercury in the thermometer used to rise to ——! I fear to repeat the number of degrees mentioned to me; but it certainly represented an amount of heat greater than I should have supposed it possible for an European to bear.

But this was not his only difficulty. There was an almost absolute want of water, so that, after fixing and toning his prints, he could only steep them for an hour or so in the smallest quantity of water which he could afford for this purpose, he then hung them up in his tent to dry, and, I am told, took no farther trouble about them, yet they have remained to this day, I believe over eighteen months, fresh and perfect in colour; I wish I could say as much for my best prepared and best washed prints, nay, even for some in my possession done by our best artists.

May not a lesson be learned from the above statement? Sulphur volatilizes at 180°.

Has exposure of the print, after toning and washing, to a dry heat (say about 180°) ever been tried, as a preservative against fading and change of colour.

Perhaps light and heat combined may be required? a glass case may be so arranged as to represent, to a certain extent, an Indian tent in light and heat.

Perhaps, also, "time" may be of great importance in trying the experiment?—I am, your obedient servant, N.

Photographic Notes and Queries.

Splitting of the Collodion Film.

Sir,—In your notice of my former communication on the above subject, you complained that I was scarcely logical, and I admit that on reading my note again, you had some reason for your opinion.

Since I made you that communication I have found the statement to which I have referred, and as it is by no less an authority than the late Editor of your journal, a gentleman whose opinions on matters connected with chemistry I believe ranks very high. I send it you for the information of your readers. In Vol. iv., page 60, of the Photographic News, in reply to a correspondent, "W. L. C.," he says:—"Too much bromide will act mechanically, causing the film to tear;" also, in the same column, in reply to another correspondent, "Collodion," he states that "too much iodide or too much alcohol will cause the film to slip off when washed. The remedy is more pyroxyline or ether, &c." Thus showing that the authority quoted does believe in the fault arising in some cases from the nature of the sensitizing compounds. Of course, I am aware that these opinions may be mistaken ones; but as editors of Scientific journals are always supposed to be thoroughly conversant with the subjects on which they write—in fact, are teachers of a high class—one naturally considers their opinions worth attention until they are disproved.

I may add to the former notice of my difficulty in this way, that the film showed symptoms of its disposition to split up, on removal from the sensitizing bath, therefore, it could not be from developer or fixer. I cleaned the plates with unusual care after the first failure, and therefore consider the difficulty lay between bath and collodion; but in the case of "A Perplexed Amateur," one would scarcely refer it to the collodion, as he states that several collodions act in the same way in his case. And as he also states that he finds it occur in the wet process, it can scarcely be the preservative agents. May not his difficulty lie in some peculiar condition of his sensitizing bath? would it not be as well to try the collodions, &c., with another bath? I must apologize for troubling you again on on this subject, the importance of the matter to all who practise the beautiful art of photography, I trust will be found a sufficient excuse.—I am, sir, yours respectfully, E. E. L.

P.S.—I would ask your talented correspondents who suggest various additions to, and substitutes for the preservative agent to consider how they would treat such a case if working with wet collodion only? As in this, I think, will be found the solution of the difficulty.

[In referring the advice, which you quote, to the "late editor," "whose opinion" &c., you doubtless allude to Mr. Crookes, and your remark regarding the value of his opinion on matters connected with chemistry, we have pleasure in fully endorsing. You are in error, however, in your conjecture. Mr. Crookes had ceased to conduct the News at that time, and is not responsible for the opinion quoted. As there was an interregnum between the retirement of that gentleman and our own acceptance of the duties, we are uncertain as to the author of the advice. It was doubtless, however, conscientiously given, and based on some grounds. We cannot, however, indorse either statement. We have not found, in the course of very considerable experiments in the manufacture of collodion, that bromides, in much greater proportion than they are generally used, exercise any mechanical effect on the film. And regarding excess of alcohol, we should rather consider it as an adjunct to the preservation of the film, than as a cause of splitting, provided always that the film was allowed to set sufficiently before immersion. There are two or three prolific causes of splitting films in both wet and dry processes. The most common is the use of imperfectly cleaned or damp glasses; the next, immersion before the film is well and evenly set; the next, is under-exposure and prolonged development; the next, an imperfect sample of pyroxyline; the next, too much water in the collodion. An acid bath may aid some of these causes, but will not, we think, produce the effect alone. Other causes, as have been suggested, may operate; but in the wet process we believe, these are the chief causes, and their frequency of occurrence will be found in the order in which we have stated them. If the glass be perfectly clean and dry, the film properly set, and the exposure sufficient, even where the other causes are present, the films will very rarely split.—Ed.]

Dear Sir,—Through a mistake, the News was mislaid, so that I was debarred the pleasure of the perusal of its contents till this evening, and I hasten to inform your correspondent, "A Perplexed Amateur," if he will make a thin solution of gum arabic, and pour over the plate after fixing and washing, he will no longer have cause to complain of his films splitting. I practise the tannin process, and am perfectly satisfied with the same, being the most simple, *and, in my hands,* the most successful. Since using the gum solution, as recommended by Mr. Sutton in his "Notes," I have never lost a negative from the film splitting, I also use it after intensifying, and can dry my negatives by the fire and varnish them off at once, without distorting my features from fear of seeing the film part company with the glass.

Have you or any of your correspondents tried alcohol and acetic acid for cleaning glasses, if not, you will not regret the trial.—I am, sir, yours obediently. J. Drake.

Printing and Toning.

Sir,—As you did me the honour of inserting in your last week's News a receipt for mauve toned prints, I now give my *modus operandi* for printing on albumenized paper. I sensitize on a 30 to 60-grain solution of nitrate of silver, six to twelve minutes, according to strength of bath. Slightly over print and remove to bath No. 1, composed of

Soda acetate	4 drachms
Water	10 oz.

Allow the print to remain at least ten minutes, to convert all free silver into acetate of silver; and then slightly wash and place in toning bath No. 2.

Gold chlor....	4 grains
Soda acetate	4 drachms
Water distilled	10 oz.

This bath must be made at least 24 hours before use, and will keep any length of time. Tone to a rich purple, and fix in a 25 per cent. of hypo.

The advantages of this mode of converting the free silver is, that you can use any strength of silver, so long as you float a sufficient time. Tone with less gold, and no fear of mealiness, or lack of brilliancy. Should you think this worth insertion, you can do so.—I remain, yours, &c., A Cure.

Talk in the Studio.

South London Photographic Society.—The next monthly meeting of this Society will be held at St. Peter's School-room, Walworth Road, on the evening of Thursday next, when a paper will be read by Mr. Valentine Blanchard.

Photographic Exchange Club.—The referees met last Monday evening for the purpose of examining and classifying the specimens forwarded. A large number of prints of very varied character passed through their hands. We shall have something to say on the subject in our next.

M. Joubert's Enamel Photographs.—M. Joubert had the honour of attending at Buckingham Palace a few days ago, for the purpose of exhibiting specimens of his photographic transparencies enamelled on glass, to Her Majesty and the Prince Consort. Her Majesty and His Royal Highness expressed themselves highly pleased with the pictures, several of which they ordered.

Formic Acid in the Developer.—A correspondent writes: "Two days since I tried formic acid in an iron developer, adding 1 ounce of acid to 6 ounces of ordinary developer. The day was very dull, and the view was up a brook, with deep shadows under the bushes along the sides. I gave two wet plates each 1 minute's exposure. In the deepest shadows the ordinary iron developer brought nothing out, whilst that to which formic acid had been added, gave some detail in every part.

Elementary Instruction in Science.—It may be of interest to some of our readers to learn that Mr. Highley, who has been for some time past connected with our contemporary the *British Journal*, is about opening a class-room and laboratory, at his residence in Dean Street, Soho, for elementary instruction in science. His programme includes the following subjects: photography, its principles, practice, and applications; the microscope, its accessories and manipulations; the rudiments of zoology; the principles of mineralogy; and the elements of geology.

Photography and the Drama.—For the first time, to our recollection, photography has been made an important element in working out a dramatic plot. In Mr. Dion Boucicault's new "sensation" drama, the Octoroon, now performing at the Adelphi, a photograph is made the *Deus ex machina* for detecting a murderer. A camera containing an excited Daguerreotype plate being within range of the scene, a portrait of the criminal is secured. How the plate is developed we have not learnt, such accounts of the plot as we have seen being silent on this point. At an early opportunity we must inquire further. Possibly the author is aware of a self-developing process!

Robbery at M. Silvy's.—Francesco Bianchi, Italian, residing at No. 11, Conduit Place, and described on the charge-sheet as a secretary, was charged on Saturday last at the Marylebone Police Court with stealing from No. 38, Porchester Terrace, since the 14th instant, fifteen gross of *cartes de visite*, thirty photograph copies of the "Beauties of England," being portraits of some of our most eminent ladies, twenty other photographs, two miniature cases, and other articles, to the value of £91, the property of Camille Silvy, who deposed that on the 25th he heard that some of his pictures had been offered for sale without his consent or knowledge. Some things were brought to his house, which he identified as belonging to himself, and which he had not missed. He was a photographic artist, and prisoner was employed by him. Vincent Silvani and Angelo Anguissola, Italians, were both called into the box, but their evidence could not be understood, as they spoke English so badly. Pink, 85 D, stated that he received information from the prosecutor that a number of his valuable photographs, which had not yet been published, were being sold in London, and that they must have been stolen. From inquiries he made he saw Bianchi go into No. 156, Bond-street, where he offered several pictures for sale. That (Saturday) morning he again saw him in the Edgware-road, after which he went to Anguissola's residence in Marylebone-lane, where he was followed by the officer, who found a large number of prints there. The officer took possession of these, and in company of the two witnesses went to the prosecutor's house, where they pointed out the prisoner as the party who offered them the photographs for sale. The prisoner then said he was guilty; that he had stolen them because his wife had been writing from abroad for money. He was then taken to the station and charged. Prisoner was remanded for the attendance of an interpreter.

To Correspondents.

*** The Photographic News Almanac will be ready in a few days. It will form a complete epitome of the art, with all improvements, as at present practised.

M. R.—The collodion process is *the* process for a beginner in photography. Commence as suggested with stereoscopic pictures. The two works you name will prove excellent guides. Write to us when you meet with any specific difficulties, and we will try to help you.

C. J.—The glass received. A report upon it in our next.

An Old Subscriber.—We can only suggest such a remedy as you propose, namely, a varnish of india-rubber. Possibly, rubbing with the slightest trace of oil might answer.

T. W. S.—The backgrounds of glass positives are coloured with powder colours, prepared for the purpose, and applied carefully by means of a large camel's hair brush. See Mr. Wall's work on Colouring, recently published at this office, or "Newman's Principles and Practice of Harmonious Colouring" 2. You will find in practice whether your toning bath is any worse. If the gold has become precipitated from some cause, your only plan is to make a fresh bath. 3. The best mode of getting a good print from a negative the lights of which print through too much, is to use a highly albumenized Rive paper, a strong silver bath, and print in the shade, instead of sunlight. 4. Negatives may be vignetted in the camera by using a screen of the right colour, with a serrated aperture of the right size, just in front of the lens. We have described the plan more than once recently in the News.

A Subscriber, Norwich.—The circumstance must be an accident. We will enquire about it, and see to the remedy.

C. C., Belgium.—The Birmingham Exhibition has only just closed, and you will doubtless receive your print. We saw it there, properly hung.

N. Oliver, B.C.S.—Your picture is very good for a beginner. The chief fault is want of sharpness. In a portrait always see that the face is quite sharp, whatever else may be deficient. The present lecturer on photography at King's College is the same Mr. Dawson, recently of Bruce Castle. We quite agree with you as to his entire fitness for his present position.

Annesley Free.—We have repeatedly recently recommended the toning bath with acetate of soda, and given the formula. Use 30 grains of acetate of soda to each grain of chloride of gold, and about 5 oz. of water. You will find a detailed article on printing and toning in the Photographic News Almanac for 1862.

Photographic Amateur.—Cyanide of potassium will remove fresh silver stains from linen. It will be more readily done if a solution of iodine and iodide of potassium be applied first. See detailed instructions on p. 345 of the present volume.

W. J. P.—Photographs cannot be taken by the light of a common gas light. The only available means we know of taking photographic portraits by night is with the aid of Moule's Photogen. The light is not so good or so manageable as day-light; but where night portraits are required, it may be used with a certain amount of success.

James Russell.—We have forwarded the letter to Mr. Fox. The almanac shall be sent when ready. The only person who makes any portion of the solar camera that we know of is Mr. Atkinson, of Liverpool. Any brass worker could make the part you require, if you can furnish him with pattern or instructions. Possibly your own mechanical ingenuity may enable you to contrive a means of getting all the motion you will require. You should endeavour to see one.

S. S.—We do not recommend the No. 1 B lens, to which you refer as preferable to the stereoscopic lens, if it be required for ordinary stereoscopic work only. The reply to which you refer was in relation to a specific case. It would only be preferable where great rapidity was desirable, the advantage being that a larger field in good focus could be produced by its full aperture, than could be by the other. The front lens can be used as a single lens, the focus being about 9 inches. Mr. Sutton is a first-rate operator, and can produce excellent negatives. Of course, we can give no information regarding those of which you speak. Our own time is too fully occupied to permit us to undertake such duties. Regarding the development without the addition of silver, all we can say is, that we have succeeded with every plate we have tried, prepared by different persons; and so have many others. Try it.

G. H. C.—The shade had better not touch the lens tube. Bear in mind it must be a sufficient distance in front of the lens to act as a shade at all. If it be in contact with the lens, it will only serve as a diaphragm, and will not shade off the sky.

F. M S.—The camera should be placed opposite the chest for standing figures. If it be higher, the feet will suffer. If it be lower, you get a view of the face too much under the features, and the effect is not good.

G. G.—The reason why mahogany or other expensive woods are always used for cameras, is simply that most commoner woods would warp and twist, and the utmost truth in the make, and the best standing qualities in the wood are imperative. 2. A tripod stand is not suitable for the operating room; it is liable to be knocked over from its feet spreading so much. A small closet may be used for a dark room; but it is desirable to have as much space as possible in order to do the work conveniently and well. Some means of ventilation are imperative. Water laid on, and a sink, are of the utmost importance.

Excelsior.—You ought to obtain instructions with the Jamin lens for using all its combinations. When used as a portrait lens with the 3rd or central lens in its place, the focus is shortened, and the action made more rapid The ¼-plate lens so arranged, is not suited for card portraits, as it will not cover sufficiently. For such work it must be used without the central lens. There is a method of using the extra lens in conjunction with the front one for landscape purposes. The orthoscopic lens is chiefly used for copying or architecture.

T. W. H.—The law of copyright, as relating to works of fine art, is in a somewhat indefinite state at present, so that it is doubtful how far the law might prevent your copying copyright engravings; but there is no doubt morally about the dishonesty of such a practice.

Robert Sawyer, and several other Correspondents in our next.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 171.—*December* 13, 1861.

THE PHOTOGRAPHIC EXCHANGE CLUB.

The classification of prints under the new regulations of the Photographic Exchange Club was completed for the first exchange last week, and we presume by this time the exchanges are in the hands of all the members. Somewhere between three and four hundred prints were forwarded for exchange, varying in size from stereographs to eleven by nine, and varying in quality from first-class to as bad as bad could be. Although the gradations of merit or demerit were perhaps more numerous, it was found sufficient for the purpose of the referees to divide the prints received into five classes. These consisted of first, second, third, and fourth, and, we regret to add, it was necessary to head one column as "rejected."

In forming their judgment the referees were guided not simply by the quality of the photography, but also by the artistic merits of the pictures, the rarity of the subjects, and the amount of effort involved in securing them. A choice or rare subject with third class photography generally secured a place in the second class for exchange; whilst a piece of the most perfect photography, which merely consisted of a series of uninteresting brick buildings, taken out of the operating-room window, apparently to try a plate, or a very perfect view of flat country, without one feature of interest, was always uncompromisingly thrust into the fourth class if it were not rejected altogether.

The question of rejection cost the referees much anxious consideration. They were very unwilling to regard any of the pictures with unnecessarily harsh criticism, and felt great hesitation in discouraging the efforts of even the least experienced. It might have been quite easy also to have exchanged any that were rejected with others as bad, which were also rejected. But it was considered that in doing this, much of the educational value of the exchange system would have been destroyed. The beginner or bungler, as the case might be, might easily take the flattering unction to his soul that there were others at least as bad, nay worse than he, for in such case it is but human nature for each to regard the bad pictures of his neighbours as still worse than his own. It was then finally determined therefore, when anything fell below a certain standard, if it contained either nothing in the subject, or nothing in the treatment to give it any interest, or if from very palpable carelessness or culpable indifference, it was imperfect in manipulation; that in all such cases the picture should be returned to the sender as unsuitable for exchange. We regret to say there were some very glaring cases of unfairness, which compelled the referees to use the rejected class without scruple. Some had, apparently, made a collection of their waste prints, such as were under-printed, over-printed, soiled, stained, or otherwise imperfectly manipulated. This is altogether too bad, and should only be met by committing the prints to the flames, without the trouble of return. Some in the rejected class, were, however, the failures simply arising from inexperience, the faults arising chiefly from under-exposure. Those members who have sent their best results must not be disappointed, if they find them returned as unsuitable for exchange; but take courage and continue sending until they attain sufficient excellence for acceptance. Whilst the referees cannot undertake, as in some instances they were requested, to enter critical correspondence with members, as that would involve a responsibility altogether too great, where the services are altogether honorary, they will have pleasure in giving careful consideration to all prints, however imperfect, which indicate that the tyro is doing his best, and will gladly recognize, by acceptance and exchange, the first decided traces of improvement.

There is another ground of complaint against some members, and that is inattention to, or disregard of, the rules laid down. Some members do not state the particulars required, especially as regards the right and left half of stereoscopic prints. Some send a miscellaneous assortment of mounted prints, apparently the weeding out of some collection. This disregard of rules was not made a ground of rejection; but if it be continued, we fear, will in future disqualify the prints for exchange.

We have referred to the faults which have characterized some of the prints first, because it is important that some effort should be made to avoid them. Each member should feel himself bound in honour to send the very best prints he can produce from his best negatives, and also to comply honestly with all the conditions laid down for his guidance. Neglect of any of the conditions of membership imposes additional labour upon those gentlemen who gratuitously undertake the management of the club, and if it be passed over by them is to a certain extent an injury to other members. We have dwelt upon the evils occurring in the first contribution, in the hope and conviction that they will not occur again. *Verbum sap.*

We are glad to be able to record the fact, that amongst the contributions were many very excellent photographs, both large and small, and these in sufficient numbers to justify a hope that the Exchange Club, under its new organization, will prove a source at once of profit and pleasure to the majority of its members.

THE "PHOTOTYPE" CARBON PROCESS.

Most photographers are aware that the carbon process, invented by M. Joubert, and styled by him the phototype process, is at once the most rapid and the most permanent method of photographic printing yet discovered, and the most nearly allied to the ordinary processes of letter-press or copper-plate printing. We have from time to time received enquiries as to the ultimate intention of the inventor regarding the process, whether it was to be given to the public, or patented, or to remain a secret known only to himself. We are now authorised to announce that as his own time is so much engaged in the prosecution of the enamel process, M. Joubert is prepared to treat for the sale of his carbon process, either to the public or an individual on equitable terms. The process has cost M. Joubert a certain amount of time and money, which he is naturally desirous of being reimbursed, and as he is unable from other engagements to work the phototype process commercially himself, he is unwilling to allow it to remain a dead letter to the public any longer. We shall be glad to see some enterprizing photographer, who possesses the necessary capital, work the process successfully. It unquestionably is the best solution of the possibility of carbon printing which has yet been discovered.

BURNT-IN PHOTOGRAPHY.

BY MICHAEL HANNAFORD.

M. Joubert's recent private exhibition of photographs burnt-in on glass, makes it manifest that this branch of art is capable of many useful applications in ornamentation; and as among our readers we number many given to experimentalizing, we would recommend such as have the appliances to turn their attention in that direction.

The process patented by M. Joubert has already been detailed in these pages, but it may not be out of place to give a short *resumé* of it. A piece of glass properly cleaned is coated with the following solution, filtered before use :—

Saturated solution of bichromate of ammonia	5 parts
Honey	3 „
Albumen	3 „
Water	20 to 30 „

A *positive* by transmitted light, on glass or paper, placed on the sensitive plate when dry, will give, after a short exposure to light, a faintly indicated picture, in a negative condition. To bring it out, an enamel colour, in a very finely divided state, is gently rubbed on with a soft brush until the whole composition, or subject, appears in a positive form. It is then fixed by pouring over the whole surface a solution of alcohol containing a small quantity of acid, either acetic or nitric. A gentle immersion, horizontally, in a large pan of water will, in a short time, dissolve out the chromic solution, leaving only the enamel. When dry it is ready to be placed in the kiln for fixing.

The ultimate colour of the burnt-in picture depends entirely on the nature of the "enamel colour" we employ. Most of our readers are aware that in the process of "fixing" the colour of the metallic oxide undergoes in nearly every instance a very considerable change. Thus if, for instance, we place an ordinary negative in the kiln, the black deposit of silver will be converted into light yellow. If our negative be toned with gold the tint will be orange, or red orange, accordingly as the amount of gold is greater or less, this metal giving ruby tint under the influence of heat.

On looking more closely at our burnt-in picture, we shall find that only a portion of the deposit is fixed *in* the glass, the remainder forming a deposit which may be scraped off. If, however, we had added a "flux" to the enamel colour, the whole of the reduced silver would have been retained permanently.

In order that the experimenter may proceed with some degree of system, he will find that a knowledge of the ordinary process of enamelling will be of considerable service. We therefore give a short account of that process, together with a list of the different metallic oxides to be used in obtaining the various tones.

The Process of Enamelling.

A bright metallic surface (gold or copper is best), is coated with a thin stratum of "flux" ("*frit*" or "*paste*"), coloured with metallic oxides, and fused under the blowpipe, or in a small furnace.

The preparation of the film varies, the quality being dependent upon the duration and degree of heat employed. A few of the formulæ are here given.

1. Powdered flint glass 12 parts, powdered flints 4 parts, calcined borax 3 parts, red lead 16 parts; mix in a Hessian crucible for 12 hours, then pour out into water, and reduce to powder in a mortar.

2. Lead and tin equal parts. Calcine in an iron pot at a dull cherry-red heat, and scrape off the oxide as it forms, being careful to obtain it free from undecomposed metal; then reduce it to fine powder by grinding and elutriation. This is termed "calcine." Take of it, and of ground flints, each one part, pure carbonate of potash 2 parts, and partially fuse in a crucible, by which it undergoes semi-vitrification.

3. Powdered flints 13 parts; nitre and white arsenic of each 1 part. Proceed as before.

4. Flint glass, 3 oz.; red lead 1 oz. As before.

By increasing the quantity of *sand*, *glass*, or *flux*, the enamel is rendered more fusible, and the opacity, or whiteness, is increased by adding oxide of tin. Borax is apt to cause efflorescence and loss of colour.

Different colours are communicated by the addition of metallic oxides to flux prepared by one or other of the above methods. Thus, oxide of cobalt gives blue; oxide of iron, brown; black oxide of copper, green; sub-oxide of copper, ruby red; oxide of gold, purple; oxide of silver, yellow; oxide of manganese, amethyst; oxide of tin, opaque white, &c.

Placing the colours in alphabetical order may, perhaps, be more useful for after reference.

Black.—(1) *Calcined iron* (protoxide) 12 parts; *oxide of cobalt*, 1 part. (2) *Peroxide of manganese*, 3 parts; *Zaffre* (crude oxide of cobalt) 1 part.

These are best used with white flux.

(3) *Pure clay*, 3 parts; *protoxide of iron*, 1 part. A fine black.

Blue.—*Oxide af cobalt.*

Brown.—(1) *Manganese.* (2) *Calcined iron* with *antimony.* Oxide of cobalt may be added to alter the tone.

Green.—*Black oxide of copper.* (2) The same, with the addition of a very small quantity of *red oxide of iron.* The colour is less decisive. (3) *Oxide of chromium* enough to colour. The tone is superb, but liable to turn to the dead leaf tinge in inexperienced hands. Transparent flux should be used, (4) *Black oxide of copper* 15 to 20 parts, *oxide of chromium* 1 part, with transparent flux. This last colour is nearest to emerald. (5) *Blue* and *yellow enamel* in different proportions.

Olive.—*Blue enamel*, 2 parts; *black* and *yellow* do., of each 1 part.

Orange.— *Red sulphate of iron* and *oxide of antimony*, of each 1 part. Melt with flux containing a large proportion of read lead.

Purple.—*Oxide of gold*, *purple precipitate of cassius*, or *peroxide of manganese.*

Red.—(1) *Red oxide*, or *protoxide of copper.* Should the colour tend towards green or brown, from partial pertoxidisation, the red colour may be restored by the addition of any carbonaceous matter, as tallow, or charcoal. (2) The *salts of gold* produce shades of red, inclining to crimson, of the most exquisite hue. (3) Red sulphate of iron, with flux containing a large proportion of red lead.

Rose.—*Purple enamel*, with *oxide of silver*, according to the tone desired.

Violet.— *Peroxide of manganese*, with alkaline flux. Contact with carbonaceous substances should be carefully avoided.

White.—*Oxide of tin.*

Yellow.—(1) *Oxide of silver.* (2) *Oxide of lead*, with a little *red oxide of iron* fused with flux. (3) *Lead*, *tin ashes*, *litharge*, *antimony*, and *sand*, of each 1 part; *nitre*, 4 parts; mix, fuse, and powder; and add the product to flux. (4) *White oxide of antimony*, *alum*, *sal ammoniac*, and *pure carbonate of lead*, of each 1 part (all in powder); mix, and expose to heat sufficiently high to decompose the sal ammoniac. Used as last. Very bright. (5) *Oxide of uranium*,

(To be continued.)

Scientific Gossip.

Mr. Casella, the well known meteorological instrument maker, has lately introduced to the scientific portion of the public a new minimum mercurial thermometer. Although such instruments are, strictly speaking, meteorological rather than photographic, yet they are so frequently used by scientific men as well as by the better informed portion of the general public, that we think a short account of this one will prove of interest to our readers, more especially as it accomplishes what no other thermometer has yet been able to effect; namely, give a correct and invariable record of the lowest temperature which has occurred during any given time. Scientific men have long been striving to devise some such instrument whereby the extreme of cold could be registered with the same fluid (mercury) which is used to record maximum temperatures. The late Mr. Welsh, the talented director of the Kew Observatory, repeatedly turned his attention to this subject, and at length gave it as his opinion that the construction of a mercurial minimum thermometer was a physical impossibility. Physicists were therefore forced to rely upon the indications given by spirits of wine, which is the least objectionable of the other available fluids. This, however, possesses many disadvantages. Owing to its being a bad conductor of heat it is sluggish in its movements; moreover it wets the capillary tube, and that in so uncertain a manner as to preclude the possibility of proper compensation in graduating; it is likewise liable to evaporate and condense in minute, colourless, almost invisible bedewments in the vacuous portion of the stem; and in tropical countries these objectionable features are intensified. Furthermore, a mercurial thermometer can obviously be made more delicate than a spirit one, and mercury can easily be obtained pure and constant in properties, which is not easily attainable in the case of alcohol. It will thus be seen that in bringing out a mercurial minimum thermometer, Mr. Casella has conferred an important boon upon scientific men. The principle upon which its action is based is very ingenious. The maker has employed the two forces, the cohesive power of mercury to itself and the adhesive power of the metal to glass, in a most ingenious manner, so that they can act in opposite directions. A small pear-shaped chamber, with a capillary orifice, is connected by a bent tube to the bulb end of an ordinary mercurial thermometer. The end of the chamber adjoining the tube is cut off abruptly, so that its flat end, with the fine capillary hole in the centre, forms one end of the tube. The instrument is filled with mercury in such a way that its lower portion is full of metal, except the little chamber, and the stem is then graduated in the usual way. In order to set the instrument, it is suspended horizontally, and the bulb end gently raised, and if necessary, tapped until the mercury begins to flow out of the chamber. The instrument is then lowered on to a support at a gentle incline, and kept so; the column of mercury continuing to obey the law of gravitation, and flow up the thermometer tube until the little supplementary chamber is empty. The force of adhesion between the mercury and the flat end of the chamber which nearly closes the bent tube, now exerts its influence, and holds the mercury close to the diaphragm, preventing its further rise in the stem. The instrument is then allowed to remain undisturbed, the column of mercury indicating the temperature of the surrounding air. It is now influenced by an alteration of temperature in the following manner:—If the temperature of the air becomes colder, the mercury will contract, and in contracting it will exert itself in opposition both to the adhesion between the mercury and the glass of the capillary bore in the long stem on the one part, and the adhesion between the mercury and the flat glass diaphragm of the supplementary chamber. The former adhesion being the weakest, the mercury will only contract out of the graduated bore of the tube, and the temperature will be seen to "fall." But suppose, now, that a rise of temperature takes place; the mercury will expand, and in this case also will have two directions in which it can move. It may either "rise" in the graduated stem of the instrument, or it may expand through the diaphragm into the supplementary chamber. In the former case, however, it will have to overcome the adhesion which the capillary bore of the tube exerts upon the fluid, whilst there is scarcely any resistance to oppose its expansion into the chamber. A rise of temperature, therefore, does not affect in the slightest degree the position of the end of the recording column in the graduated tube, but merely causes a certain quantity of mercury to flow into the chamber. Suppose, now, that the temperature sinks a little, the first action is to draw some of the mercury out of the additional chamber; as the temperature sinks, the mercury is drawn out until it reaches the diaphragm. The temperature at this point is exactly the same that the column in the longer tube points to on the graduated scale, and now the mercury having reached the diaphragm of the pear-shaped chamber, all movement at that end of the instrument ceases, and the further contraction of the metal takes place in the graduated stem. It is thus seen that whatever be the number or amplitude of rises and falls of temperature during a given time, the end of the column of metal in the graduated stem always points to the *lowest* degree of temperature to which it has been subjected. We have been thus explicit in explaining the construction of the instrument, inasmuch as there is a great deal of misapprehension in respect to its *modus operandi*. It is not easy to understand without a careful examination of the instrument itself, and hence really scientific men who ought to know better, have fallen into grave errors respecting its working, and have, moreover, given their erroneous impressions to the public in print. The most common fault of which this thermometer is accused, is that it will only register the minimum temperature provided there has been a constant fall from the time the instrument is set to the time of greatest cold. An attentive perusal of our above description of its working will show this opinion to be founded upon a totally incorrect idea of its mode of action.

The proper colour of pure water has long been an interesting subject for speculation and experiment. We have already given in these columns an account of the fine experiment of Dr. Tyndall, in which he threw a beam of electric light, in the form of a circular disc, on to a white screen, the upper portion being allowed to pass simply through air, whilst the lower rays were sent through fifteen feet of water; thus clearly showing that the water was of a blue colour. Some further researches have now been made by Dr. Wittstein, in which, whilst corroborating Tyndall's results, he throws light upon the variations from the normal blue colour which is frequently noticed in natural waters. From analyses performed by himself and others, of the water of several rivers in Bavaria, he arrives at the following conclusions:—1. Pure water is not colourless, but blue. 2. Mineral substances dissolved in natural waters do not alter their colour. 3. The various colours of natural waters are due to dissolved organic matter. 4. This organic matter is retained in solution by the aid of an alkali; it is in mass of a deep brownish black colour, in dilute solution of a yellowish brown colour; and belongs to the class of bodies known by the name of humus, or humic acid. 5. The quantity of the organic matter in solution depends solely upon the quantity of the alkali. 6. The less organic matter is dissolved in the water, the less does its colour vary from blue; with an increase of the organic substance, the colour gradually passes into green, yellow, and brown, the blue being gradually obscured. 7. Every natural water meets with a considerable portion of one agent changing the colour, namely, humic acid; whilst the other agent, the alkali, is distributed in very variable degrees: the colour of waters poor in free alkali, therefore, approaches blue most closely; an increase of the alkali causes an increase of humic acid, and, consequently, a change of colour into green, yellow, and brown. 8. It follows, therefore, that the nature of the rocks over which the water flows furnishes the principal condition for the colour of water. 9. Periodical changes of the colour of the same water are not caused by a different amount of organic matter, but are dependent upon atmospheric conditions, such as cloudy sky, fog, &c. 10. As a general rule waters are softer the more they approach the brown, and the harder the nearer they come to the blue colour. The cause is not the amount of organic matter, but the amount of alkali contained in solution, on the latter of which, however, depends the proportion of the former. These results are more important than they would appear to be at first sight. As a satisfactory solution of a problem in physical chemistry they deserve considerable attention, and they more especially merit notice from our readers on account of the light which they are calculated to throw upon several photographic phenomena. The colours of lakes, rivers, and other masses of water are known to vary considerably both to the eye and also in their photographic action; these results of Wittstein satisfactorily explain the reasons of this: whilst, if subaqueous photography should ever rise from the position of a scientific *tour de force* to that of an every day performance, the correct understanding of the causes of the variation in colour of the surrounding medium cannot fail to be of the highest importance.

Two samples of glass have been forwarded to us, marked respectively C 1 and C 2. C 1 is a flashed glass, and in C 2 the colour is in the body of the glass. They are of a brown colour, and in the spectroscope are seen to allow large quantities of chemically acting rays to pass through. They are therefore comparatively worthless for photographic purposes.

MY IMPRESSIONS OF PHOTOGRAPHY IN PARIS; AUTUMN, 1861.*

BY C. JABEZ HUGHES.

What a world of change is experienced in some ten or twelve hours by the transit from the hard, matter of-fact, overcrowded, dingy London streets, to the gay, free-and-easy, jaunty, pleasure-inviting, boulevards of Paris. With a sort of steam-engine hop skip-and-a-jump you leave the wharves of the Thames and light on the banks of the Seine—and are in a new world.

Here is Paris; the same clear blue sky, dry air, and smokeless atmosphere that it had two and ten years ago. Alterations may be made, new Louvres built, old *quartiers* demolished, mammoth boulevards formed, fresh barracks, more soldiers, but Paris is still Paris, *toujours Paris*. There is the same happy-go-lucky, holiday look about the people, as if they never were thoroughly in earnest, making amusement, not labour, the main object of life. This is not, perhaps, the place to indulge in one's thoughts of the difference between the English and the Frenchman; but one's attention cannot avoid being forcibly arrested. The one is all work and little play, and so he is a dull boy; the other all play and little work, hence he is a gay one. The former is, comparatively, a dull beast of burden, the latter a frivolous butterfly, and the conclusion cannot be avoided, that both extremes are bad, and that if the commercial treaty could produce not only a modification of tariff but of character too, an immense advantage would be gained.

Being deeply interested in English photography, and with some knowledge of its present condition, I could not avoid making some comparisons. My impressions, such as they are, I wish to be received as hasty observations snatched during the prosecution of other business, and therefore open to the remark of being superficial and perhaps erroneous. In walking about the streets of Paris, and observing the specimen cases so plentifully displayed at the corners, I saw a great change had been made during the last two or three years. Formerly, the cases were filled with "touched up" pictures, having "put in" backgrounds. There were also abundance of coloured ones in oil and water-colours, with all sorts of interior and exterior background monstrosities. All these have been ruthlessly swept away by the Cartes de Visite mania. Like Aaron's rod, it seems to have absorbed everything. Here and there a few whole-plate or larger pictures are seen, but they are evidently some of the old staff, retained in the establishment for former services rendered, and to show to customers not bitten by the new mania, that the art of taking pictures larger than the quarter-plate is not forgotten. But high and low, rich and poor, in establishments good, bad, and indifferent, the absorbing idea, to the exclusion of all else, is the *Carte*. As at home, all the stationers and fancy dealers have their shop windows filled with portraits of every local, and general celebrity. The number of impressions of these portraits that are printed at some of the principal establishments is stupendous, and I should be sorry to trust myself to name the figures, for fear of being charged with romancing.

I was much surprised at the utter absence of glass positives everywhere. I had previously noticed that the French never took kindly to them. It is true they rarely produced good ones, yet a few years ago I saw at an establishment in Rue Vivienne some as fine as I have ever seen, Mr. Lee's, of Liverpool, always excepted. The French had a passion for stripping these positive pictures off the glass on to black cloth or leather. Their tone—never very good—was thus made worse, and I am not surprised that they were abandoned. Following in the wake of poor Daguerreotype, they are only seen on the extremities of the faubourgs, among the poor blouses, and seem half ashamed to be discovered there. My attention was once arrested in an out-of-the-way suburb by a shabby looking case of specimens, nearly all of which were glass positives. They were very dark, dirty, and stainy. The printed notice in the case, however, was curious, for it informed the public in general, and his neighbours in particular, that the proprietor followed the joint occupations of blacksmith and photographer. At home I had seen, with displeasure, the unhappy union of photography with ice and roast-chesnut shops, with barbers and cigar shops, with Greenwich and Gravesend tea and shrimp-rooms, but this was a new combination of the *utile* and the *dulce*. I looked in at the man's establishment, or yard rather, and, under the plea of inquiring prices, had the opportunity of taking observations. On one side of the yard was a smithy, with some bars of iron in the fire and a boy blowing the big bellows. On the other side was a kind of shed, with a calico covering over one end. This was the "glass room." A piece boxed off at one end formed the dark room. A franc was the charge to be operated on, *passe-partout* extra; colouring was a luxury he did not humour his customers with. A female who preceded me was prepared to submit. The staff to manage both establishments consisted of the artist and the boy already named. With a bow worthy of Count Persigny the artist begged the female to be seated, and, taking a glass, gave it two or three rubs with his leathern apron, proceeded to pour on the collodion. Thinking I had discovered a cause of his dirty, stained plates, and not wishing to be witness of more indignities on my favourite art, I prepared to leave, when two more customers entered—a part of heavy cart horses—who were ordered to be shod *toute suite*. Business was evidently brisk, so lifting my hat, and with a *bon jour*, I departed to the more congenial *atelier* of my friend Bingham.

During former visits to Paris the impression was that photography was destined to pass into the hands of the artists, for few prints were seen except touched up, or coloured, so that the poor photograph was lost. This illusion is happily dispelled, the age of reason has returned; pure and unalloyed prints are heartily believed in, and fully appreciated.

The practice of vignetting I did not find so much adopted as I should have expected among our taste-loving French brethren. The engrossing anxieties about the *cartes* are, however, sufficient to prevent the practice of that or any other kindred novelty that depends on delicacy of manipulation.

I found a grievous deficiency of landscape photography as compared with ourselves. I looked in vain for quiet beautiful landscapes, charming pastoral scenes, and those sweet pictures of nature that we are so familiar with at home. France evidently has no Bedfords, Heaths, Mudds, or Wilsons. I know not to which country Maxwell Lyte yields fealty, but supposing him French, then an Englishman is their best in this role, but clever, truly clever as he be, he is by no means up to the standard of the names I have mentioned, especially as evidenced in their recent works. The French in their nature seem more demonstrative and noisy than ourselves. When they want landscape they rush to the Pyrenees, choosing black gorges, or ice-clad mountains, with glen torrents, and sterile peaks, instead of selecting those scenes of quiet beauty with which the mind is daily familiar, and upon which it always longs to gaze.

* These autumn impressions have been deferred until winter from press of matter.

MM. Bisson *Frères* need not so frequently rush to Switzerland when the banks of the Seine are so closely at home, and while the Bois de Boulogne contains some of the most charming examples of landscape gardening. It certainly is from no inability to do good work, that this deficiency of good landscapes arises, as was proved years since by those almost poetic scenes that Silvy produced when an amateur. Witness also the many charming views by Count Aguado, to whom the beauties of the real "Champs Elysée," the Bois de Boulogne, are by no means unknown. I am not insensible to the great merit of some of the pictures of Baldus who has shewn full capacity to produce lovely landscapes, and of great size too. M. Jeaurenand too has recently shewn some lovely pictures from Taupenot negatives that might almost be taken for Mr. Mudd's, especially as his method of printing the skies is so similar and equally effective.

Stereoscopy seemed to be on the decline. True many of the shop windows are crowded with slides, but they looked like old stock, and a great number, indeed most of the groups, are English ones. I was sorry to see Her Majesty, and the members of the Royal Family figure so indifferently in the shop windows. Nearly all the prints I saw were poor copies, and not original prints at all. That vile habit of piracy does not appear to exist in Paris, and they must have been imported.

Among the professional photographers, I was pleased to observe less of that keen competition and desire to undersell each other. There is very little of the cheap and common portraits. I did see a few, very few, in out of the way places, like our photo-blacksmith, that took franc pictures, but three francs seemed to be the low price among the hardworking neighbourhoods. It struck me that there were not nearly so many photographers in the common neighbourhoods, and certainly the class of work is much better than with the same class among ourselves. It was a great blessing to find an utter absence of "touters." You may stand and look at a case of specimens at a man's door till you are tired, without being annoyed, insulted, or assaulted.

I spent a good few hours in the Photographic Exhibition, studying the vast collection of grand pictures. I have seen nearly all our exhibitions, but the present Paris one far exceeds any one we have ever yet had in this country.

My remarks respecting it I had better reserve for another paper.

ON WASHING POSITIVE PROOFS.

BY GEORGE SHADBOLT.*

There are, perhaps, few photographic manipulatory operations that are looked upon as so excessively tedious as that of the final washing of the otherwise finished proofs. In fact, every kind of "dodge" has been resorted to in order to lessen its irksomeness, and, if the truth must be told, to shirk the trouble involved in a thorough removal of the last traces of the fixing agent and what it holds in solution, and which, from its great solubility in water, requires an enormous amount of that fluid to be applied with no little judgment in order to effect the object in view. With most operators, the grand panacea for defective washing appears to be considered as existing in an unlimited supply of *running water;* but, apart from the injurious action which a very long continued immersion in water entails upon the photographic proof, by partial removal of the size from the paper, and other deleterious influences, I am altogether incredulous about the removal of the double hyposulphite of soda and silver by any length of immersion merely, even in a running stream. I have frequently been called upon to give advice to those engaged professionally in printing operations, relative to this very question, and have indicated a course of proceeding which, in no single case, have I found to fail, nor has any one who has tried it complained of on account of inefficiency; but, I am bound to admit, that several have abandoned it because of the alleged extra trouble involved.

The plan to which I allude is the employment of many changes of water at moderately short intervals of time, say every ten minutes, but being careful between each change of water to hang up each print separately to drip for several minutes. By this operation the print becomes divested of by far the largest portion of the adhering fluid contaminated with the double salt of soda and silver, and is in the best condition, on its re-immersion into fresh water, to allow the small remainder of the deteriorated fixing solution to become still further diluted.

I am ready to concede that this plan entails some extra trouble; but the question is, whether the advantage gained be not well worth the trouble? And I contend also that, in practice, the extra labour is not nearly so much as is generally supposed, while it must not be forgotten that the kind of labour requisite is not of any costly value, but little skill being demanded for its performance, and in addition, it by no means follows that we may not by some ingenuity be able to reduce the amount of the extra labour, as we now please to regard it.

For suspending photographic paper while drying, after any of the operations to which it has been submitted, I have for many years past made use of the wooden American clips, commonly used for clothes pegs, and which are procurable at the rate of about one shilling per dozen. By thrusting a common pin through one side of the clip, near the open end, and turning it into a hook by means of a pair of pliers, the clip itself can be readily suspended across a cord, wire, or slip of wood, and the paper proofs are not torn, but held between the jaws of the clip, just as they would be by the finger and thumb. I propose then to apply these American clips to economise our labour, as follows, viz.:—after the first soaking of the proofs in water, when fresh from the fixing bath, I would hang each one up by aid of *two* of the clips, that is, one at each of the upper corners of each sheet, in such a manner that one angle of the sheet of paper should hang somewhat lower than the other, in order to assist the dripping of the fluid, which might be farther encouraged occasionally by the touch of a glass rod for a moment. A washing cistern, of a depth sufficient to receive the proofs in a perpendicular position, should be placed under a tap, and have a hole in the bottom near one of its corners, to let the water run out, and which can be stopped by a plug, or any other convenient method. Several metal or wooden rods, long enough to reach quite across the cistern, should be provided, and admit of being supported each upon a couple of hooks, at some little distance from a wall. As each proof is removed from the first washing water, the two clips are to be attached, as already described, and these can be hung by aid of their pin-hooks on to the rods. Each rod may take six or eight proofs. When all are hung up, the water in the cistern may be allowed to escape, and the cistern re-filled, during which time the proofs will be losing the water adhering to them; then the rod on which the first prints were hung may be taken up bodily with its suspended prints, and the latter lowered gently into the fresh water, the ends of the rods resting on the sides of the cistern.

I am aware that the prints will have a tendency to rise towards the surface, but by very little care they may all be made to sway in one direction, and as soon as one set is properly in, a second rod may be inserted next to the first, and so on until the cistern will hold no more. By the time the last has been set in, the first will have probably been in about ten minutes, and may be taken out again and hung up as before, and the whole operation repeated as many times as may be found needful—probably about a dozen times will be quite sufficient—so that in a little more than a couple of hours, a considerable number of proofs may be more thoroughly washed from the remains of the hyposulphites, than are done by the present method in from six to twelve times as long a space of time. It is much to be

* Read at a Meeting of The Photographic Society, December 3rd, 1861.

regretted that we do not possess any reliable test for very minute quantities of the hyposulphites remaining in the prints—personally, I prefer that of the taste to any other—nitrate of silver, and nitrate of mercury, have both been used, but I find that long after I have been unable to detect any remains of the hyposulphites by them, after hanging up the print until surface dry, the small remaining drop of liquid at the corner is appreciably sweet to the taste.

I am aware that a method of warming a suspected print is employed by Mr. George Dawson, the recently appointed lecturer on photography at this college, when a slight scent of sulphur is detected by him, but I find my sense of taste more acute than that of smell.

I have frequently sought to devise some means by which the noxious hyposulphites might be converted into some innocuous substance capable of ready removal; but, unfortunataly, this plan involves decomposition, the direst evil we have to dread, as it appears to be to the decomposition of the hyposulphite of silver that most of our spoilt prints are due.

I fear that I may run some risk of being charged with taking up your time with too trivial a matter for consideration, but I have done so upon the grounds that small annoyances by constant repetition become great evils, and I have found from experience that at this, as well as at some other societies, although the paper read may, *per se*, be of little value, it not unfrequently originates a discussion, from which much that is useful and instructive arises. I will therefore conclude, with a hope that my very slight suggestion may do so upon the present occasion.

A PROLOGUE FOR THE SEASON.

BY VALENTINE BLANCHARD.*

In the good old times when good Queen Anne was on the throne, no play was considered perfect without its prologue and epilogue. In these modern days, however, they are quite out of fashion, and are stowed away upon the dusty shelves of the bygones. Is it that we have no Popes, no Addisons, nor Goldsmiths to write them, or is it that they might raise expectation too high, and call attention to the literary shortcomings of the modern drama? We will not pursue this speculation further, but we think we may, with propriety, borrow the word for our remarks. At every annual meeting we have, what we will call, the epilogue in the secretary's report, but thus far we have had no prologue.

Now we do feel strongly impressed with the conviction that all societies like ours might, with advantage, devote the first evening of the season to an introductory address, briefly reviewing the past, but more especially chalking out clearly, in bold outline, the course for the future. In the discussion which would follow this address, many new suggestions would be given forth, some of which might be adopted with great advantage, and would tend to throw new life and vigour into the meetings of the society, giving at the same time increased pleasure to the members.

We cannot help feeling that hitherto the course of our photographic societies has rolled on too smoothly in the well-worn tracks of routine, and the time has come when we may with advantage seek out new paths, even though the roads may not be quite so smooth. At least there will be the charm of variety, which will banish the listlessness and shake off the drowsiness into which some of us have fallen.

If we glance at the early history of the parent society, we shall find it had its origin in the efforts of a few photographic enthusiasts to remove the patent restrictions which held our beautiful art in the chains of bondage. All honour to them for their successful labours. The names of some of them have become "as familar in our mouths as Household Words," and others of them alas are gone from us; but they too have left

"Footprints on the sands of time."

Years have rolled smoothly on since the London Photographic Society first commenced its labours, and it has gradually grown into a goodly body, but it has scarcely, to our thinking, used well the means at its disposal. The tendencies of the age are ever onward, and woe to those who lag behind. We would like to see the parent society the *avant courière* of photography, and not a Lord Mayor's coach, broken down by its own stateliness.

If we look at the origin of our small, but not "very small." society, we shall find that our worthy secretary was paternal and maternal progenitor, nay, even godfather and godmother as well. We all owe him much for his untiring labours; but we do think some of us mistake the way to show our gratitude. In all seasons we find him at his post. Nothing keeps him from his duties, not even the terrible wind, which Dickens tells us always roars with tenfold vigour at Walworth. That he is right we all know, for on one or two occasions last season, the speeches could scarce be heard, so lusty was the voice of Boreas in spite of his hoarseness. No, Wall had plenty of the cement of the Roman in his frame, and was always to be found the right wall in the right place. We are sure then nothing would repay him for all the sacrifices of time he has made for us, so completely as a regular attendance on the part of all the members at the meetings of the Society. We think all of us can look back with pleasure to the past season. The attendance, however, was not uniform. Some meetings brought but a scanty array of members; now we do hold it an imperative duty on the part of those who join a society like ours, where some of the body put themselves to no small amount of trouble to prepare papers for the amusement and instruction of the members, we do hold it a duty we repeat, resting on each of us individually, to repay the reader for his trouble by being present. Surely this is not much to give for his labour. We have felt so strongly this to be a duty, that during all the time we have belonged to the society, we have been absent but twice, and then we were a hundred miles away.

We all know how easy it is to frame excuses for our absence. We are only too ready to say, "I do not feel much interest in the subject for to-night's meeting;" or, "Well really I should have thought that subject worn out by this time, I shall hear nothing new to-night, so will e'en stay at home;" or we look at the state of the weather, and find that the wind is in the east, and blows with something more than the breath of a zephyr through the balustrades of the bridges, and, with a shuddering twitch of the shoulders at the picture conjured up, and a vigorous poke at the fire to drive off the sensation, we readily enough determine to remain at home, and stifle any qualms of conscience by a promise made to ourselves to read carefully the report of the meeting. If we were, however, to place ourselves in the shoes of the disappointed essayist when he sees but one pleasant wall, and four blank ones to greet him, we should let nothing but illness keep us away.

But whilst we cannot help condemning strongly the indifference displayed by some of the members of our society, and we fear the fault is but too common in other societies besides our own, we believe a cause may be found without much difficulty. We can conceive nothing more pleasant or enjoyable than a photographic gossipping club, where every one can come within the magic circle of sociality, and cast in his scrap of information for the general benefit, without a feeling of apprehension and fear of that most dreaded individual the reporter, which we are sure takes possession of the boldest of us. We can speak from experience, for we never get up to make a remark without feeling a palpable fog—a London one in its completeness—stealing gradually over our mental faculties, and the subject, which stood before us clear as noon-day, has assumed in consequence such a strange

* Read at the Meeting of the South London Photographic Society, on Thursday evening, December 12th.

and distorted appearance, that we ourselves can scarcely make out the outline, and as for colour or details, alas! they are entirely lost to us. To resume, then, in such a friendly circle as we describe, each one speaks with freedom, and, in the comparison of notes, all are in turn gainers; for we do not believe that photographers are, as a rule, miserly over their knowledge. We have, it is true, occasionally met with a man who carries a book filled with precious secrets, each one of which is worth its weight in chloride of gold, but he has invariably shown himself a veritable "mar-all," whose boasted photographic gems are but spoiled paper and wasted chemicals. We fear this pleasant gossipping club would scarcely prove practicable where the number of members is large, but we do think, however, a little of its geniality could be introduced into our meetings to thaw a little of the frost sometimes felt, and which we fear chills some of our members.

Let it not be understood that we desire to depreciate the importance of meetings like the present; such is not our object; but we do think it possible to introduce some new features, which may enhance rather than lessen their value.

We would like the experimental committee to be a committee of the entire Society, for we feel assured that the members generally would be benefited by the change. During the past season we heard of the labours of that body but twice. If our memory serves us rightly, only two reports were laid before the meeting, one of which was passed as read; that is to say, the members were referred to the journals, if they were desirous of learning the contents of that report. We would have a subject announced for investigation. Let it be some new process to test, or some old photographic paradox to clear up. No matter what the subject, let there be sufficient time allowed for experiment, and then, on the evening appointed for discussion, let each member come prepared with the results of his researches. We might then reasonably anticipate a very animated and pleasant evening, the more so if the subject chosen could be illustrated by comparative results. If it were possible to make the experiments in the presence of the members, it would tend in no small degree to clear up many of the conflicting statements now existing on many photographic subjects. This, at present, in most cases, would be impracticable. If, however, members would find time for experiment, and set themselves to work, faithfully recording their failures, at the same time carefully preserving their results for comparison at the meeting, we could not fail to be gainers, and the subject would, in consequence, awaken the interest of all the members.

Our great desire, however, is to see classes for the study of chemistry and optics organised in connection with the society. We do not think this proposition will be regarded as impracticable, for we have already amongst us men whose attainments, in both chemistry and optics, stand deservedly high; for not only are they well versed in the theory, but have daily to combine it with the practical parts of these sciences. We feel assured that these gentlemen would gladly aid us in our endeavours to make this society more thoroughly educational than it has hitherto been. The future of all Photographic Societies should lie in this direction, for how invaluable to all engaged in the practice of photography would be knowledge of chemistry and optics. Now the professional photographer has but few opportunities of acquiring a knowledge of these sciences, beyond the fragmentary information which must present itself to him in the course of his labours, for chemistry is one of those sciences that it is almost impossible for one to pick up by himself. It is always more easily taught in class. Besides, the expense is an important consideration. When, however, it is shared by the many, the difficulties are at once removed.

We feel assured no one here will underrate the importance of a knowledge of chemistry to all photographers. We know there are some who say sneeringly—Well, I don't care about so much theory, give me the practical part. They seem, however, to lose sight of the fact, that they are very much in the condition of the child on the lap of the mother; they are helpless until the food is put into their mouths. Such men eagerly swallow all that comes in their way, and then snarl by way of payment. No; we all owe much to the chemist for his patient, plodding labours, and for his microscopical powers of observation; and we long for the time when we can follow him in his labours, and fully understand his power of producing those combinations which, like the score of a grand symphony, can be written in a language wholly unintelligible, presenting to the eye of the uninitiated a confused mass of figures and letters, strange hieroglyphical characters, totally without meaning, but which, when once the key is obtained, presents a succession of harmonies ever new and varied, but so beautiful in their variety that the beholder or listener never wearies. The photographer, without a knowledge of chemistry or optics, is like the man who plays upon an instrument without a knowledge of music, or rather like the man who talks, but cannot read. He knows collodion is collodion, but ask him to spell the word or point it out when he sees it in print, and he stands mute and helpless. We long, however, for the time when, instead of standing up a dunce, not knowing all our letters, we shall be enabled to read the language of chemistry with a fluency that shall be as prefect as that of the accomplished musician when he glances over the sheet of music, or with the same ease that we would read an ordinary book.

That this time will come we do not doubt, let us use our influence to bring about its speedy approach. It is possible to make photographic societies more educational in their effects. Let us all do our utmost, and the difficulties will soon vanish. We look upon the efforts in this direction as stepping-stones to something still higher.

If the isolated labours of patient men have done so much for photography, what may not be accomplished in the future, when every earnest photographer is a tolerable chemist, understanding well the uses of the tools placed in his hands. There is no limit to the possibilities of the future. If single men have done so much in clearing up the mists which enveloped photography in its infancy, and which are by no means entirely dispelled now, what may not a body of patient workers, made up of different organism —the sceptic, the enthusiast, the wary lover of proven facts, and the brilliant theorist—what may not such a body do, composed of such opposite materials, but all actuated alike by a deep devoted love of photography. We can place no bound to the future. The wild dream of to-day becomes the common-place fact of to-morrow. But a few years ago we had a lord, one of whom England is justly proud, ridiculing the insane notion of burning smoke at the end of a long pipe, and yet to-day the thing is so common that we never bestow a thought upon it.

We ardently long for the time when there shall be a photographic society, so high in its standing, that wealth shall have no key able to unlock the door; and when only those can gain admittance who have proved themselves worthy by their known attainments. The members of such a society might, with just and honest pride, then write F.P.S. at the end of their names.

The formation of the classes we have mentioned would be a step in the right direction, and would tend to make this dream of the future a bright reality. Gentlemen, our prologue is over.

TONING PRINTS ON PLAIN PAPER.

BY OSCAR J. WALLIS.*

[The following paper accompanied a fine collection of reproductions of photographs, which were presented to the Society. They consisted of Kaulbach's drawings, illustrating the female characters of Goethe which were never

* Read at a Meeting of the American Photographical Society, November 11th, 1861.

engraved, but were instead, photographed by M. Albert, of Berlin. If our memory serve us correctly the original drawings were in crayon monochrome, and an anecdote is told illustrating the exquisite truth of the reproductions by M. Albert, which states that the very touch and effect of the crayon was so accurately rendered that it was almost impossible to distinguish them from the originals without touching the surface to feel if it were chalk. The artist seeing a person applying this test one day to a picture in his studio, snatched it away, saying that such fingering would spoil a crayon picture. It turned out, however, to be one of the photographic copies which deceived the master himself at first glance. The original photographic copies sold at three guineas each. Mr. Wallis, in a letter to the *American Journal of Photography*, states that he succeeds much better with the alkaline gold bath for plain paper than he did with the old hypo and gold bath.—Ed. Photographic News.]

The prints are on plain paper, that is, Saxe paper, prepared according to Hardwich's formulæ—

Water	1 ounce
Chloride of ammonium	5 grains
Gelatine	1 ,,

I float the paper according to thickness, from one to three minutes.

For silvering I use ammonia-nitrate of silver of the strength of—

Nitrate of silver	1 ounce
Water	10 ounces
Nitric acid	½ drachm.

The solution is brushed over with the well known Buckle's-brush. As to printing, I do not consider it sufficient to have the paper prepared all right; the negative has also to be a certain intensity, one that will take from three to five minutes to print in strong sunlight, and will then give an impression with the highest lights clear and the shadows bronzed.

The negatives from which the accompanying impressions were taken, all print in from four to five minutes in sunlight.

The following operations have all to be done in the *dark-room* by candle light

The prints are washed in running water for one hour; I then pass them into a dish with a weak solution of salt, in water, made faintly alkaline with carbonate of soda. (If too much carbonate of soda is added it removes the size from the paper, makes the impressions sink in the water and prevents an even varnishing of the finished prints with gum arabic.)

After remaining in this dish about thirty minutes the prints are singly taken out into the toning-bath, consisting of—

Water	1 quart
Sol. of auro-chloride of sodium	6 to 8 drops
,, carbonate of soda ...	,,

The auro-chloride of sodium I prepare myself according to the formulæ given in the *Revue Photographique*, and also in the *Notes*, and save at least sixty per cent. by doing so instead of buying it. I do not crystallize it but leave it in solution and use it as above, after adding water to the concentrated solution until it has a light golden colour.

To get fine tones, the print should be toned in from five to ten minutes, I generally take out every 8th proof, adding another before taking out the next. In this way a large number can be toned in one hour. Every proof is immediately rinsed and then left in running water until all are toned. The gold solution is preserved in a bottle and poured off from the sediment into the dish, adding gold and soda each time it is used. All the prints are now again changed into a dish with water, from which they are then taken singly or in small numbers into a solution of hyposulphite of soda, which I make as follows:—

Saturated solution of hypo	1 pint
Water	1 ,,

The print appears perfectly fixed almost as soon as passed through the solution, but I generally leave it in about five minutes. The prints are lastly washed in running water, from two to three hours, according to the number; to get clean prints it is necessary to wash the fingers well from hypo before touching unfixed ones.

As soon as the hypo solution begins to colour or deposit, I pour it into the residue, and use fresh solution in its stead.

It has been said that proofs done in this way were also toned by silver or sulphur because they improved in tone after leaving the hypo bath. But this is not so. The tone *does* improve or rather look blacker, but from quite another reason. The deposit of gold commences on the surface and on being longer continued enters also to a certain extent into the fibres of the paper, but generally there remains a substratum of untoned chloride of silver which shines through the gold tone, and gives it a reddish tint, which the hypo removes by dissolving it out. It can also be noticed that on first immersion the print takes a general red tint, which, after a minute, disappears, and leaves the gold toning in its full strength, which will account for the improvement in tone.

I believe that prints toned in this way are as well washed in half an hour as in two hours. The fibre of the paper being thoroughly saturated with water before it touches the hypo, allows the fixing to be done in a few minutes, and must, of course, facilitate the washing.

The proofs are mounted and varnished with gum arabic.

THE WET COLLODION PROCESS.

BY M. JANE.

A correspondent in Belgium sends us the following statement of formulæ and manipulations as practised on the Continent, with very successful results:—

The Collodion is made according to a formula communicated to the writer by M. Wothly, and stands as follows:—

Ether (pure)	500 parts
Alcohol	300 ,,
Soluble cotton	8 ,,
Iodide of cadmium	4 ,,
Iodide of ammonium	4 ,,
Bromide of ,, ...	1 ,,
,, cadmium	1 ,,

When the collodion is intended for dry plates 1 part of pure resin (colophony) is added.

Negative Bath for Portraits.

Distilled water	1000 parts
Fused nitrate of silver	80 ,,
Iodide of cadmium	1 ,,

After standing twenty-four hours, during which time it should be occasionally agitated, the bath should be filtered, and five parts of iodine (powdered) added. This iodine remains in the bottle and facilitates the production of clean brilliant pictures with the above collodion.

The Developing Solution consists of—

Distilled water	500 parts
Protosulphate of iron	75 ,,
Acetic acid	10 ,,
Sulphuric acid	1 ,,
Acetate of lead about	3 ,,

Mix and filter. The solution may be used repeatedly and is better after it has developed a few plates. Distilled water is used because it contains less oxygen than common water, and the solution will keep longer without deterioration. The same solution without the acetate of lead gives very good results.

The Fixing Bath consists of hyposulphite of soda of from twenty-five to thirty per cent.

Intensifying. I intensify with bichloride of mercury and iodide of potassium, after the manner described in the Photographic News. If the negative be very thin and require considerably strengthening, I use the following method:—

First, apply a solution of bichloride of mercury of four per cent. until the negative becomes brown (not till it is white) and well wash.

Next apply a three per cent. solution of iodide of ammonium (that which has liberated a little free iodine and is yellow I like best), until the negative becomes sufficiently dense, and the colour of a brownish orange tint, or, what is a better printing colour, a greenish orange tint.

Thoroughly wash and cover twice with a ten per cent. solution of dextrine in water. A small piece of camphor in this solution keeps it good.

Varnish.—I protect the negative with a varnish prepared as follows:—

Benzine	100 parts
Soft copal	10 „

This is applied cold, and there is less danger of injuring the negative than with a varnish which requires the aid of heat.

For dry plates I find the same collodion excellent, and use it without any preservative. The bath is made as follows:—

Distilled water	1000 parts
Fused nitrate of silver	100 „
Acetic acid (crystallizable) ...	100 „
Iodide of cadmium	0·5 „
Iodine (powdered)	5 „

This bath is mixed in the same way as for wet collodion. The plates keep well and give brilliant negatives.

PHOTOGRAPHY IN ITS RELATION TO THE FINE ARTS.*

"Define terms," it has been said, "and controversy will cease." Unfortunately for the simplicity of this dictum the uncertain relation of well defined terms to indefinite ideas constitutes the whole difficulty. The term "Fine Art" is one of the most common to be found in the works of writers on æsthetic science: its meaning in a general sense is understood by everybody; but for any precise definition, any accurate statement of the conditions involved, any unchallengeable landmarks pointing out its extent or limitations, we may search in vain. The consideration whether photography possesses a legitimate claim to a position amongst the fine arts involves, however, at the outset, that the conditions necessary to such recognition should be defined. All art may be broadly divided into two classes, the mechanical or industrial arts, and the beautiful or fine arts. The first has reference only to what belongs to the material facts—the physical necessities of man's life. These supplied, he discovers that he has a higher nature and nobler cravings which must be satisfied. The subjugation of matter to all purposes of material use is the province of the industrial arts. The perception and embodiment of the beautiful in its various forms belongs to the province of fine art. The distinction here drawn is a broad and obvious one, and has, in effect, been universally recognized. We shall have to enquire, then, to which category photography belongs, whether it is a mechanical or a fine art.

Every work of fine art is the embodiment of a pre-existing idea in the mind of the artist. Whatever the process used, none of its products can become works of art merely in virtue of that process; its art qualities must entirely depend upon the skill of the artist. It is the artist who makes the art, not the art the artist. The time was when painting and sculpture were not known as fine arts; they were not admitted into the sisterhood of the Nine. They had not at that time, we presume, become recognized methods of embodying the beautiful. Poetry, music, eloquence, dancing and similar arts were the more natural and spontaneous expressions of man's sense of the beautiful, while the plastic and graphic arts demanded some aid from science for their satisfactory culture. The industrial arts, with science for their guide, needed to make some progress before sculpture or painting could make many strides towards perfection,—the art of working metals, the art of hewing stone, must precede sculpture; and pigments must be found and their physical properties ascertained and developed as a preliminary step to painting. Photography, the latest born of the graphic arts demands still more aid from science; but it claims not the less a position among the fine arts. Whatever of art-knowledge is required by the painter is required by the photographer; and the same order of mental powers, developed by the same kind of training, is as necessary to one as to the other. Each must have the perception of the beautiful before he can embody it. The true artist, whether he be painter or sculptor, engraver or photographer, will stamp the impress of his powers upon his work; while the mere mechanic to whose material perceptions the more subtle and higher beauties of nature have no existence, whether he use a chisel, a pencil, or a camera, will as assuredly prove that neither sculpture, painting, nor photography are necessarily fine arts.

In a certain sense, however, it may be claimed for photography that a higher culture is necessary for its successful practice than is requisite for the prosecution of any of the recognized fine arts. To the natural endowments and education necessary for a painter he must add the education and habits of a first-rate chemist, and with these he must combine manipulatory skill, neatness and order, each in their highest degree. In selecting his subject, his point of view, his time of day, and mode of lighting, he must exercise the judgment and taste of a painter. This done his optical knowledge must decide the form of lens best suited to the perfect rendering of his subject. And now his results depend upon a series of chemical manipulations of the most exquisitely delicate kind.

As regards the art itself, then, and the amount of skill and culture necessary for its successful practice, there is nothing to derogate from the claims of photography as a fine art. The question resolves itself into one of results. These entirely depend upon the artist. The rough sketches of a Raphael with a piece of charcoal are treasured as works of art, because they give expression to the beauty of form in the mind of the artist. The true artist produces true art, no matter what his vehicle of expression, and the first ranks amongst photographers are already filled up by men who have been associated with art before they practised photography; such as Bedford and Wilson, Lake Price and Rejlander. The new art needs, however to be wielded by such men in order to receive recognition, for photography cannot create or idealize. It is not an imaginative art; it must be literal. It must deal with the actual; the world of imagination is to it a *terra incognita*. What it sees of beauty or deformity it uncompromisingly depicts and nothing more. "But for Apelles," Ovid remarks, "Venus would still have remained concealed beneath the waves," and to photography the goddess still remains invisible; what its eye hath not seen it cannot depict. It cannot refine the vulgar or give freshness to the commonplace. In all ages painters and sculptors have secured the most perfect and true types of beauty by judicious selection and harmonious combination from many models; but if photography cannot combine, it may still aid high art by the contribution of fragmentary truth; here however, its sphere in the domain of high art ends.

All this may be admitted without hesitation; but it in nowise affects the question at issue. "True art," remarks an able writer, "has two legitimate divisions: high art and common art. The former includes all work which renders the spiritual—which appeals for its interpretation to the soul; the latter comprises merely the faithful representation of natural objects. Genius guides the first; for the second, industry and clever imitation are sufficient." In the highest

* From the *London Review*.

ranks of the second division here described, photography may claim a place. Correctness of drawing, truth of detail in a degree unapproachable by the nicest manual skill, absence of hackneyed conventionalisms, are at least amongst the merits of all photographs of average excellence, while in portraiture photography may unhesitatingly claim pre-eminence. Undoubtedly there is more truth, more character, more vraisemblance in a portrait by Williams, Claudet, or Mayall, than was to be found in nine-tenths of the "portraits of gentlemen" that have for years past hung on the walls of the Royal Academy. In fact, wherever literal truth, accurate detail, perfect imitation is of value in art, there photography takes honourable prominence, for the most painstaking pre-Raphaelite may emulate in vain its wondrous precision.

As regards the reproduction and multiplication of works of art, photography may, unquestionably, in many respects claim precedence of engraving, which is nevertheless, recognized as a fine art, and admitted within the walls of the Royal Academy. In the reproduction of the works of the great masters, for instance, not only is the drawing rendered with unerring truthfulness, but the very touch, the precise handling is reproduced.

Photography must nevertheless be admitted to be an art *sui generis*. It is more allied to science than any other of the graphic arts, and in some of its most beautiful phases it becomes a scientific process, scarcely dependent for its results upon any kind of manual, still less artistic, intervention.

The recent controversy between her Majesty's Commissioners and the Photographic Society regarding the classification of photography in the forthcoming International Exhibition, has illustrated, for the first time since the birth of the new art, the importance of having its position accurately defined. Recognized art authorities do not admit photography to be fine art; that was to be expected. On the other hand, photographers disclaim the mechanical position. The Commissioners decide on a happy compromise: they offer to photographers a separate department, a kind of neutral ground. The question is not whether photography is a fine art *per se*—neither painting nor sculpture can make that claim—but whether it is capable of artistic expression; whether in the hands of the true artist its productions become works of fine art. This photographers have to prove, and await the decision of one of the largest juries ever empanelled since the world began. There is one other question the Commissoners have yet to deal with: how will they modify the position of photography in the catalogue? They can scarcely leave it in its present companionship.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 11*th December*, 1861.

The arena of photographic book illustration is steadily enlarging, and with results increasing in interest and importance. M. Gide has lately published a work on "Mexican Antiquities," photographed by M. Charney. The curious and interesting relics of an ancient civilization present themselves under a new aspect when delineated by the photographic art, and may now be said to be represented in all their integrity for the first time, for with whatever care the artist may have executed his task, truth in detail, it is now evident has been disregarded to a great extent.

Another work of the most splendid character has just been issued by M. Gide; one in which photography also performs the part of illustrator. It is entitled "*Tresors d'art de la Russie Ancienne et Moderne.*" It consists of two hundred photographic views representing the most important architectural structures of the vast Northern Empire, with their interesting details, and the treasures of all kinds contained in them. The photographs are executed by M. Richebourg, the text is by Theophile Gautier, a most competent critic in matters of art, whose taste and erudition qualify him to study a country as a museum.

M. de la Blanchère has just published a *Monographie du Stereoscope.* It is divided into nine parts, viz.: 1. History and Discovery. 2. Modifications, Improvements, and various Constructions of the Instrument. 3. Different Theories of binocular Vision. 4. Of the Material. 5. On the production of Stereoscopic Pictures by Photography. 6. Of Negatives. 7. Of Processes in which Films are Superimposed, and of Dry Collodion. 8. Positive Proofs. 9. Various Apparatus connected with the Stereoscope. This table of contents is sufficiently extensive and inviting to induce the reader to anticipate a very comprehensive treatise on the subject, and the perusal will not disappoint him. The work has been executed with conscientious care, and, as might have been anticipated from the author of one of the best treatises on photography extant, it has all the clearness and precision of a practical operator and practised writer. The book is amply illustrated, and may be considered as a timely addition to photographic literature.

On and after the 1st of January next, photographs may be transmitted by post between France and Algeria and the United Kingdom and Malta, at the rate of thirty centimes for each packet weighing under 120 grammes, or about three pence for a package not exceeding two ounces in weight, which must be open at the ends, and not contain any letter or note of the character of correspondence; if this condition be not complied with the package will be charged full letter postage. A special stamp will be provided for packages of this description, bearing the initials P. D.

M. Passeur has published the results of his elaborate investigations into the nature of the yeast of beer, which may be thus summed up:—

1. Beer-yeast is not a perfect vegetable, but rather, a mass of spores, which are produced not only in this liquid, but also in the urine excreted after the injection into the stomach of beer in sufficient quantity for this production to take place.

2. These spores hitherto designated improperly by the names of *Torula* and *Cryptococcus cerevisiæ*, are susceptible of giving birth by way of generation, to a mycelium erroneously regarded by Desmazieres as a particular species of Mycoderm, *(Mycoderma cerevisiæ)*.

3. To the phase of the *Mycoderm* there succeeds that of fructification, that is to say, the production of the *Penicillium glaucum* of botanists.

4. The yeast of cider or malic yeast, presents, in its origin and development, phenomena analagous, or rather similar to those described in studying *cerevisiæ* yeast (of beer).

5. The origin of these yeasts, and probably, also of all the others, is spontaneous.

It is known that M. Pasteur has been for a long time carefully investigating the phenomena supposed to indicate spontaneous generation, and his conclusions are, that no facts exist to warrant the supposition of such a phenomenon. His researches into the nature and origin of yeast, formed an element in the enquiry, and as all his experiments were repeated by M. Musset, at Toulouse, at a distance of 250 leagues from Paris, and with precisely the same results, they assume an unquestionable authority.

FORMIC ACID IN THE DEVELOPER.

Dear Sir,—In the Photographic News of to-day, I notice that you have published an extract from a letter of mine, respecting the use of formic acid in the developer. Either I or the printer must have made a great mistake in the quantity of acid to be added. It should be one drachm, not one ounce, of formic acid to each six ounces of ordinary iron developer.

Perhaps this would be as well corrected, to prevent searchers after detail making a mess of their pictures.

I use the following developer:—

Take protosulphate of iron	...	1 ounce
Spirits of wine ...	...	1 „
Distilled water ...	...	40 „
Dissolve, and add		
Commercial acetic acid ...	...	1 ounce
Nitric acid	...	15 minims

I sometimes keep this for months without apparent change in its working or colour. It gives good whites in positives, and soft clear detail in views for intensifying. The three specimens I sent you a few weeks since were developed with it. I have sometimes tried half the quantity of glacial, instead of commercial acetic acid. Without any counterbalancing advantages, this gives yellower whites, and turns red and very slow after about two weeks. I am very particular in cleaning my plates and keeping all my bottles clean and tidy, and I never have any stains. I am inclined to attribute these always, if the plate is kept out of white light, to careless manipulation. But I am occasionally annoyed with one or two, or a small group of transparent spots in the upper part of the picture. The annexed group* spoiled an otherwise good view, taken a few days since. I always dry out the dark frame with blotting paper, and put dry paper at the bottom and top of the plate; in spite of this and other precautions, when the spots do appear, I have often found run over two, three, or four plates and then disappear, apparently as they came, without reason. I find some of my friends have had precisely the same trouble without being able to find a remedy. Can you kindly help us to one?—I remain, yours respectfully, STEREO.

Wigdon, Cumberland, December, 7th, 1861.

WAXED PAPER PROCESS.

DEAR SIR,—It is quite refreshing amid the fumes of collodion to see in the pages of the NEWS some notice of Waxed Paper, and, as an old practitioner with it, I am quite prepared to endorse the remark of your correspondent, who says, "I must confess myself astonished that this method is not more generally practised, for the results may favourably compare with those obtained on glass." For portraiture it certainly cannot compete with wet collodion, but its effect in landscapes, especially if large, are, to my eye, even more pleasing than those produced on glass; the difference appearing to be, that whilst proofs from glass negatives may be compared to engravings, those from paper more nearly resemble drawings by an artist. At the Exhibition in Manchester during the meeting of the British Association, there were, I am told, some excellent examples of pictures taken by this process, and it is to be hoped the coming display in London will also show its capabilites. Its chief disadvantages are, the length of time required for exposure and for development, but, as respects the former, it may successfully compete with dry plates, and the latter is usually completed in forty or fifty minutes, and can always be deferred to a convenient opportunity. When lately operating in the country with a friend who used the tannin process on glass, it was found that for the same subjects he required fully as long an exposure as myself, whilst, as regards convenience, I had a decided advantage, my entire "*impedimenta*" being my camera, a folio of sensitive papers, and a black bag for changing them.

After numerous experiments, I now employ a slight modification of Sisson's turpentine method, and seldom fail in procuring a good negative. A *spoiled* proof from one taken during the summer is enclosed, which will, I think, justify these remarks.—Yours truly, ALIQUIS.

Dec. 6, 1861.

* The spots in our Correspondent's letter have the appearance of oval or pear-shaped splashes, the size of a peppercorn.

Photographic Notes and Queries.

REMEDY FOR SPLITTING OFF THE FILM.—REMOVING BADLY MOUNTED PRINTS.

SIR,—If your correspondent, "A Perplexed Amateur," will turn to vol. 2, p. 263 of the NEWS, he will find an *unfailing* remedy for splitting off the film, as well as for the creeping up and contraction of the film in drying.

If, however, he has not the number at hand, perhaps it may be as well to repeat it.

Make a solution of transparent gelatine, two or three grains to the ounce, filtered whilst hot, keep this by the fire, and pour a small quantity over each plate whilst wet, and the plate will dry evenly, and the film adhere firmly to the glass even where a tendency to warp had shown itself during the development, it is equally applicable to the wet or dry processes, and the plate can afterwards be varnished as usual. The same solution forms an excellent medium for colouring glass positives with powder colour, being applied in the same manner. We have used it for both purposes, more than four years, *without a failure in either case.*

We observed that at a recent discussion at the South London Photographic Society, some gentlemen expressed a doubt of the possibility of removing a badly mounted photograph, where starch had been used. If they will try the following plan they will find no difficulty whatever, whether the print be mounted with starch, paste, or gelatine. Place the print face downwards in a large dish (a common table dish answers well) and pour *boiling* water over the back till the print is quite covered, let it remain a minute or two and then raise one corner of the mount slowly and it will come away leaving the print in the water. If the print be properly fixed, it will not receive the slightest injury by this method of treating it.—Your obedient servants, H. and J. WALTER.

Lyme Regis, December 5th, 1861.

P.S. We must appologise for not having sent the remedy sooner, but must beg to be excused on account of being prevented by business, but, "Better late than never."

CLEANING A TIN STILL.

SIR,—A correspondent in the NEWS of the 29th November, *Sigma* can clean his tin still by pouring into it a mixture of four parts water, one part sulphuric acid—which will dissolve out the oxide of iron—afterwards a weak solution of soda or potash rinsing out well at the last with rain water.—Your obedient servant, CHURK.

December 6th, 1861.

PHOTOGRAPHIC EXCHANGE CLUB.

DEAR SIR,—I highly approve of the present arrangements of the Club, but think there is a point or two on which a little more may be said, for instance, I send a parcel of prints requiring two postage stamps, enclosing, according to directions, two more for return, thus leaving no margin whatever for other incidental expenses, would it not be better to say, "enclose one stamp more than will be required for return."

My parcel of prints came to hand yesterday, a portion of them mounted, thus requiring three stamps for postage, only having sent two I am thus indebted to the secretary.

Having received mounted prints, am I under any obligation to return others mounted or not. If I understand the rules aright, that is optional.

I would suggest that where prints are to be reversed, contributors simply write, to be cut, and where not to be reversed, not to be cut; I think we should be less likely to make any mistakes, than when making each half right or left.

I beg to express my gratitude to yourself and co-partners for the time and pains you are taking for our benefit, and shall be happy if our thanks can be allowed to assume a more tangible form than mere words.—Yours &c. J. H.

[As persons sending mounted prints cannot be guaranteed mounted prints in return, so members receiving mounted prints are under no obligation to send mounted ones to the secretary in return. It would be better if all members would send unmounted prints. It is of course unfair that the secretary should be put to personal expense as well as trouble. We are glad to record that the new arrangements give general satisfaction.—ED.]

Talk in the Studio.

The International Exhibition.—The *Times* says, "Just now intending exhibitors are very anxious about their allotments of space, and the Commissioners' office is daily inundated with letters of complaint or remonstrance on the subject. We are requested to state, therefore, that the spaces are now in course of allotment with the utmost speed that the whole Staff at the disposal of the Commissioners can work them out. All the allotments will be complete and issued to the exhibitors by the 15th of this month.—[We doubt whether it will be possible to carry out this intention with regard to the allotments in the photographic department, seeing that the Committee for undertaking the matter has been so recently established.—Ed. Photographic News.]

Card Portraits and "the Trade."—The various manufacturers and dealers connected with the photographic trade complain that the mania for card portraits has seriously injured many of the commercial branches of the art, as neither cases, passe partouts, nor frames are required for these miniature portraits. One Birmingham house, who used to employ 150 persons regularly in the manufacture of miniature cases, has dismissed all but 25, who are not fully employed.

Newcastle Photographic Society.—The usual monthly meeting of this society was held on the evening of Friday last in the Weaver's Tower, Newcastle-on-Tyne, Mr. J. C. Warren in the chair. Dr. Lockhart read a paper by Mr. Sutton, describing his panoramic lens and the manipulations with curved glasses. The subject excited considerable interest, and votes of thanks to Mr. Sutton for his paper, and to Mr. Ross for the apparatus he had forwarded for the inspection of the society, terminated the proceedings.

The Robbery of Photographs. &c.—*Francesco Bianca*, an Italian, was brought up on remand, at Marlborough Police Office, for stealing about £100 worth of valuable photographs and pictures from M. Camille Silvy, photographic artist, 38, Porchester-terrace, Bayswater. Mr. F. H. Lewis, barrister, appeared to prosecute, and Mr. Fernand Strauss interpreted. It appeared that prosecutor employed about forty men, and prisoner was overseer. He carried the property away at different times, and gave it to other parties to dispose of. He was fully committed for trial.

To Correspondents.

J. White.—The best mode of giving permanency to the re-touched parts of negative, is to varnish after re-touching. It is important to varnish first to prevent injury to the film; and after the touching out is finished, varnish again.

W. L. C.—We do not quite understand what you mean by collodion positives turning *red*. Do you mean red by reflected or transmitted light? If the former, we have never met with the occurrence; if the latter, it is what is known as red solarization, and may arise from the condition of the collodion or the nitrate bath, the presence of organic matter in either, tending in some states of light to produce it. A slight trace of citric acid in the developer will often remedy it.

Photograph.—The Photographic News Almanac will be ready on Friday, Dec. 13th. There is another Photographic Almanac, published by Mr. Greenwood, which is announced to be ready at the beginning of the year. 2. The only Photographic Dictionary, except that published in our own pages, is Mr. Sutton's, which is out of print. 3. There are many houses who will supply you with good photographic apparatus, but we cannot recommend any especial firm in these pages. 4 The largest photographic paper usually made is the *Saxe*, which is 23 in. by 18 in.; *Rive* and other papers are 22½ in. by 17½ in. Extraordinary sizes are made for solar camera pictures, of almost any reasonable dimensions.

Latent-Grateful.—It is impossible to give even an approximate idea of the exposure you will require; all the circumstances of each case will so materially modify the question. The exposure with the full aperture of your Ross 5 in. by 4 in. lens for a portrait, the sitter being 9 or 10 feet from the lens, with good bromo-iodized collodion and iron development, good light, in the open air, might be about 5 seconds If in a glass-room, it would depend entirely on the amount of light. Whether a fair person or a dark person, whether dressed in white satin or black velvet, and a variety of other circumstances, will all materially affect the question. You may ascertain better by one trial than we can tell you by a dozen guesses at the conditions of the case.

R. G.—We have never tried a rolling press instead of a lithographic press for mounting after Mr. Stuart's method, but think that with certain precautions it might answer. We will try shortly.

G. H. C.—The bichloride of platinum solution, recommended by Mr. Maxwell Lyte for intensifying, should be applied after the negative is fixed. It is most suitable for pictures requiring a slight amount more vigour or brilliancy, but not much greater thickness or density.

John Frankland.—The design, No. 4, for a glass-room, in the third volume of the News, will be most useful for general purposes. We should prefer a little more glass in it for our own use, and instead of three feet at the roof and sides of the background end, without glass, we should recommend six feet. A few feet longer and wider would also be an advantage. The other design to which you refer is in some respects good, but it would admit insufficient light for many purposes, and would also require some modifications in detail.

W. G. Barnett.—We are obliged by your courteous and logical letter, which, although scarcely suited for publication, we will treasure in our private collection for the perusal of friends. We shall have pleasure in complying with your request.

Tyro.—The charges named in your note appear to us to be perfectly reasonable.

C. E. L.—The proportion of acetate of soda we prefer for our own use, and find quite successful, is 30 grs. to 1 gr. of gold. If you get an acid sample of gold, just barely neutralize it, and no more, with carbonate of soda. Whilst acetate of soda is slightly alkaline, it is not sufficiently so to neutralize any appreciable amount of acid in the gold.

Photogen.—The white fire, or "photogen," is burnt in a lamp made expressly for the purpose, which is patented. Before attempting to construct any apparatus for the purpose, you should get a copy of Mr. Moule's specification, so as to avoid infringing his patent.

An Amateur in Positives.—We know nothing of the process of M. Dubois, but what has appeared in our pages. The Niello paper is to be had of various dealers.

Justitia.—There is no simpler or better mode of recovering the silver from waste solutions, when old hypo baths form part, than that by means of liver of sulphur. It does require time, but it should not be expensive. To adopt other methods the various solutions should be kept apart, and different methods employed with each, which would be more troublesome, unless there were large quantities of each solution.

W. Bartholomew.—We have not yet had an opportunity of trying your dry plates, but hope to do so shortly. You have certainly been active in the matter. Next week you will find a suggestive article on dry processes in the News, which will probably interest you. We think dirty plates the most common cause of split films.

Tit Tat To—In our next.

Quasimodo.—The present volume will be completed at the end of the year. 2. We have never used the collodion filter, preferring to let our collodion clear by subsidence, but we are told that the filter answers. 3. The best mode of dealing with your old collodion is to mix it with some quite new. To add bromide to it dissolve bromide of cadmium in the smallest quantity of alcohol you can, taking care to know the exact proportion, and then add sufficient of the solution to the collodion to introduce one grain of bromide in each ounce of collodion.

H J. W.—See recent letters on the Splitting of the Film, and especially our note to the letter of E. E. L. in last week's "Notes and Queries." Your booth is of somewhat too limited dimensions, especially in height; it should be not less than nine or ten feet high. With the proposed dimensions you will have only eight feet at the roof and sides to admit light, and as that has to be covered with a semi-transparent cloth, we fear you will have too little light on your sitters. The Photographic News Almanac will be ready on Friday, Dec. 13th. All persons who have sent stamps will be supplied within a few days

T. P. E.—We are sorry for your trouble, but cannot unfortunately enter into the legal rights of the matter. Your course should be a very simple one; lay your complaint in writing before the Board of Health. They are bound to remove or prevent any illegal nuisance. They will determine how far it is within their power, and will, if they can, doubtless find a remedy for the wrong you suffer.

J. F. Ward.—We are obliged by your communication and the prints. We shall esteem it a favour if you will furnish us with details of your formulæ and manipulations, as we shall have something to say on the subject in our next.

Teesdale.—We have for years past obtained transparencies by camera printing, both for the stereoscope and other purposes. If you state your difficulty clearly, and describe your apparatus, we will help you with pleasure. In producing transparencies for the stereoscope, you must of course have a division between the two halves through the entire length of the copying box, otherwise you will have, as you describe, the two images overlapping each other on the ground glass. Your suggestion regarding the Exchange Club shall receive attention.

W. G. W.—The white turbidity and deposit in your toning bath is chloride of silver, and, possibly, if you use common water in making the solution, carbonate of silver, arising from the fact that you have not removed all the free nitrate from the print by washing previous to immersing it in the toning bath. The print should receive three washings of about 5 minutes each previous to toning. The deposit, although troublesome, is not, however, the cause of your failure. The prints received are imperfectly fixed, and show decided traces of decomposition in the hypo, which is either used up, or has become decomposed by the prints containing acid. Your sample of chloride of gold has probably been very acid, and in that case the prints would decompose the hypo, and produce the results you forward. See answer to C. E. L. It is better to keep separate baths for plain and albumenized paper.

A. B. C.—Your table of equivalents must be wrong, or else you have misquoted it The equivalent of iodine (I) is 126·5, and of potassium (K) 39·15, making altogether 165·65, which is the equivalent of iodide of potassium (IK). In like manner the equivalents of the iodides of ammonium, sodium, and cadmium are 144 5, 149·5, and 182·5, respectively. Thus, 144·5, say grains, of iodide of ammonium, 149·5 of iodide of sodium, 165·65 of iodide of potassium, or 182·5 of iodide of cadmium, each contains the same quantity of iodine, namely 126·5 grains; from this you may readily calculate that each grain of the several salts will contain about ·87, ·84, ·76, and ·69 grains respectively, of iodine. Tables of equivalents vary slightly. You will find one in the Photographic News Almanac for 1862.

Aliquis.—By the "approaching exhibition" we presume you mean the International Exhibition of 1862. There is no announcement as yet as to the time when contributions must be forwarded. The Photographic Society will not have any exhibition during the coming season.

Several correspondents in our next.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, Paternoster-Row.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 172.—*December* 20, 1861.

PHOTOGRAPHY AND CONTEMPORARY LITERATURE.

If, by some singular combination of circumstances, it could occur that some centuries hence photography should have become one of the lost arts, and if, at the same time, it could happen that no vestige of a photograph remained in existence, future generations of the world would, we venture to affirm, still have a most perfect and vivid idea of the capabilities and productions of this wondrous art. This idea would be preserved to them with the utmost completeness in the thousand and one passing allusions in contemporary literature, in which the art has become a standing illustration of rapid delineation, and the term photograph a synonym for most perfect, minute, and literal accuracy. Is a description of life and manners striking for its minute and graphic truthfulness? It is at once regarded as "photographic in its unerring accuracy." Is a vivid, forcible, and detailed impression of any scene or narrative received? It is said to be "daguerreotyped on the mind." Is a painting remarkable for its delicate and perfect drawing, and absence of the characteristics of conventional art? It is pronounced "photographic in its rendering of minutiæ." In a variety of forms, and an infinity of instances, the truth, the beauty, and the usefulness of the art receive constant and unpremeditated recognition.

This unconscious appreciation, this indirect and almost unintentional acknowledgment—which is by far the most valuable—is almost invariably honourable to photography: and the hearty, ungrudging recognition of some of the better writers on art subjects is not less so; but it unfortunately happens that every now and then, at intervals, a tendency or feeling creeps out and finds expression in some portions of the press, which displays an ignorance so dense, or a grudge so transparent and preposterous, that whilst we may understand its origin, we wonder how it found any chance of publication. Several such manifestations of feeling have found expression recently. It would almost appear as if the fifth-rate artists, whose occupation has long been well nigh gone, were, in anticipation of the challenge which photography will give at the forthcoming exhibition, gathering up their powers for a final effort to crush the art, and were beginning by a series of side-winds to throw contempt upon its productions. We feel it important to keep our readers informed of such attempts, and, at the same time, to rebut emphatically the false charges so often promulgated.

The first case to which we have to advert occurs in the *Athenæum*, a journal which has often rendered graceful tribute to photography and photographs, but which in a recent number offends in two instances; in one case casting a passing sneer on the art, and in the second shows a sad ignorance of the productions of English artists. In a review of a recent work by Mr. Thackeray, the writer thus commences:—

"There is a superstition amongst many people that photographs are likenesses, and that, however hideous the result may be, the photograph only brings to light the ugly possibilities that lie dormant in the individual. Again, there is a notion that caricaturists produce the strongest likenesses; it being essential to the success of caricatures that every one should 'recognise them at a glance.' In both cases candid friends mildly insinuate against the 'vanity' which protests against accepting the award. It is always easy to understand a dashing exaggeration; it saves trouble both to the artist and the public, and spares the skill and patience necessary to produce or to discern the delicate shades of the *poco meno e poco piu* needed to make a genuine portrait. What is true of portrait-painting holds good of the art of delineating character. It is easy to produce a caricature which, by its exaggeration of some salient peculiarity, is certain to be recognised—and to raise a chuckle of recognition from its trick of resemblance to some people we have seen and observed; but that does not constitute a knowledge of human nature. Mr. Thackeray's present work—the sad failure of a man of genuine powers—seems to us to be in Literature what a photograph or a caricature is in Art."

Now we utterly deny the truth, justice, or good taste of this allusion to photography. We deny that photography necessarily or in itself possesses anything in common with caricature. "Dashing exaggeration of some salient peculiarity" is precisely the thing which photography is incapable of. Even in bad photography, where exaggeration may be detected, it has no power of discriminating between "salient peculiarities" and common-place features. Moreover, "the delicate shades," &c., needed to make a genuine portrait, are in reasonably good photography, the very points of its acknowledged excellence, rather than its glaring deficiency. In the same number which contains the review, we find the following:—

"The London Stereoscopic Company have issued among their later enterprises, a series of instantaneous views of Paris—of buildings, boulevards, street-views and the like—taken, we infer, by French artists. They are extremely sharp, vivid, brilliant, full of life and motion; the very image of the actual places and events transferred and fixed for ever. We have recently been looking over a good many French and Italian photographs; and we must warn our English friends, that in the coming contests at South Kensington, they must look for stern trials of strength. The French artists have the advantage over us in marine and street subjects; the Roman and Venetian artists in landscape and structure. Our figure photography is, perhaps, superior to the French or the Italian."

Most of our readers are aware that the stereographs referred to are by Mr. William England, an able English photographer; but in the spirit which depreciates home productions, the writer "infers" they are by French artists. Quite consistent with this inference is the statement that continental photographers excel in marine or landscape photography, and that English artists are superior in figures.

These slights and errors are mild, however, compared with those we find in a recent article, entitled "The New Picture Galleries," in the *London Review*, which is so amusing in its preposterous mis-statements, that we have transferred it in its entirety to our own columns, where it will be found in another page of this number. The *London Review* stands so high as a calm and truthful exponent of art and science, and has so often been distinguished by excellent articles connected with photography, that we were deeply grieved and disappointed to find what appears to be the spiteful lucubrations of a disappointed artist in its columns, which but a few weeks before had contained an article striking for its dispassionate and fair statement of the relation of photography to the fine arts.

The first characteristic of the article in question is its *malus animus*, its spiteful motive; the second, its false reasoning; and the third its gross ignorance. The first is shown in assertions and allusions, which both the writer and everybody else know to be untrue. In such phrases as "distorted by the painful process of photography," "sufferings in the inferno of some eminent photographer," "disfigured appearance of a friend," such as might be sought for "in a morgue," and other allusions equally choice.

The false reasoning is strikingly illustrated in such arguments as the following :—

"A photographic likeness cannot be true, as will appear from the consideration that it is the result of one momentary isolated impression, and not a careful generalization. If a person who had only known us for one day were to undertake to draw our character, the odds are as Lombard Street to a China-orange that he grossly misrepresents us. Or again, if he were to describe our person, dwelling almost entirely on one feature, or one attitude or habit, we should complain of being caricatured. And this is the inherent fault whereof we accuse photography; it caricatures.

Because then a person who had known us but for one day would, in describing us, probably misrepresent us; because a person describing our person and dwelling entirely on one feature would caricature us, *ergo*, a photographic portrait cannot be true and must be a caricature! The conclusion follows upon the premises with a vengeance! Is it necessary to point out how utterly incomplete and imperfect are the analogies the writer attempts to institute between intangible "character" and definite form? The man who should attempt to describe character from a day's acquaintance, would be attempting to do what the writer states photography does not do; to "generalize," and to generalize from insufficient details. If, instead of generalizing from the knowledge gained during the acquaintance of a day, the person referred to simply and truthfully reported the history of the day's intercourse, he would neither misrepresent nor caricature. Photography does not attempt to do what many many artists attempt, and either do badly or entirely fail in effecting; but it gives a truthful presentment of what it sees and nothing more. It may only illustrate one phase of character, give one expression of face, and that expression may or may not be the usual and characteristic one, but it is not, and cannot be unless the photographer be wretchedly incompetent, or the sitter unaccountably perverse, a caricature. The allusion to the portrayal of only "one feature," &c, is simply meaningless.

We are next told :—

"A good portrait-painter studies carefully the subject of his picture, endeavouring to live awhile in his company, draws him into frequent and free conversation, marks his habits and looks under various circumstances, gathers up all the particulars of his individual appearances, and then unites and combines them in one great general resemblance."

It is no part of our business or inclination, in defending photography, to depreciate the portrait-painter; but we appeal to all who know anything whatever of the subject, as to the truth of this statement. That the few—the very few—who have made great names in portrait painting have aimed at such generalization, we will admit; but that the ninety-nine out of every hundred portrait painters—the ruck whom photography has superseded—either aimed at or obtained such a knowledge of their sitters, we utterly deny; and we point to the army of pink and blue miniatures with big eyes and little mouths, and the oil paintings with brick-dust flesh and brown shadows, in confirmation of our statement. As to the results of this boasted generalization, even in great masters, let an able writer in the *Cornhill Magazine* speak. Describing the prevalent taste in artists for producing the upper lip in the form known as "Cupid's brow," he says :—"Such is Raffaelle's favourite lip: he hardly ever has a face without it. One would fancy that all the people of Vandyke's acquaintance had it. Kneller is great in it; so is Fuseli. Sir Thomas Lawrence gives it with a vengeance to all his sitters—curling the curves, and making the little drop in the centre almost drip. The painters are never satisfied without it, and give it to all their heads alike—to Cortes as well as to Cervantes, to Descartes as well as to Shakespeare, to Arkwright not less than to Schiller and Goethe. What the painters do badly, the engravers do worse; and so this lovely lip is rendered vulgar and meaningless. Belonging to a few, and that few a defined class, it is represented as the common property of all." Such generalization the worst photography is incapable of effecting, whilst, regarding the best, we emphatically repeat what another article in the *London Review* recently stated :—"Undoubtedly there is more truth, more character, more *vraisemblance* in a portrait by Williams, Claudet, or Mayall, than in nine-tenths of the 'portraits of gentlemen' that have for years past hung on the walls of the Royal Academy."

Regarding the ignorance displayed by the writer in question, it is something at once amusing and astonishing, and reminds us of a phrase we recently saw used in reference to another subject, the ignorance on which was stated to be "not only very extensive and profound, but very elaborate and minute." For instance, we have the following :—

"A 'pistolgram,' as these rapid portraitures are now (especially when the subject is an infant) designated by the faculty, is taken, the subject is flashed upon paper, a momentary appearance is produced, and the result is invariably more or less a caricature."

It would perhaps be difficult to bag a greater number of errors than the writer has here brought down at one shot. Album-portraits (the subject the writer is treating of) are not called "pistolgrams" either by the "faculty," whoever that may be, or anybody else; "the subject being an infant" has nothing to do with what *are* termed "pistolgrams," they are not flashed on paper; the appearance is not momentary; and the result is not invariably a caricature. We have only five mis-statements in four lines; but at least four out of the five we charitably set down as the result simply of ignorance of the subject on which the writer comments.

We have not space or inclination to follow the writer in his mis-statements much further; but we will just advert to one more. By some chance he has caught part of an idea to the effect that the marginal lines produced by some lenses are distorted, he proceeds to "generalize," and we have the following :—

"Almost all have a cast in the eye. Others have either an unmeaning grin, or a silly smile, or a surly frown that Timon of Athens might have envied. One young lady looks saucy, another as melancholy as Mariana in the moated grange, another has such a dangerous look that Petruchio himself would not dare to marry her. With these defects in themselves, the figures stand or sit in the centre of a perfect chaos. Panels of walls, doors, jars of conservatory flowers, tables, and other articles of furniture, lean, roll, and tumble about the apartment, as if spirit-rapping was going on, in every position out of the perpendicular. The central figure may be in focus and straight, but even if she escape with no distortion, such as a monster hand or foot, or a cheek that seems afflicted with the mumps, all her *entourage* is reeling around her, as if she had been taken in the saloon of the big ship during the great storm."

It is impossible after reading these lines to escape one of two conclusions: either that the writer is making wilful mis-statements, or that he has qualified himself for writing the article by carefully avoiding any examination of the works of all photographers of ability and repute.

One more remark, and we have done. Referring to an imaginary lady, the writer says :—

"A photograph book is given her by some gentlemen in exchange for her likeness, which has just been taken by Silvy or Southwell. This may be multiplied to any extent, and every man who is in the original owner's set at Trinity or Christ Church may be favoured with a copy."

What class of society this writer can have mingled with we cannot conceive, nor from whence he has derived his ideas of the "sets" at Trinity or Christchurch; but if he imagines that respectable photographers sell to strangers duplicates of the portraits of private ladies sitting to them, or if he imagines that the students at any college get surreptitious copies of the portraits of ladies known to their mothers and sisters, to "bandy about" amongst the fellows of their set, we can only say, his notions of social obligation are as low as his knowledge of photography and art is shallow.

PHOTOGRAPHIC CHEMICALS;

THEIR MANUFACTURE, ADULTERATION, AND ANALYSIS.

THE uses to which the phosphates are at present applied in photography are not numerous; the most important being the printing process devised by Maxwell Lyte. This depends for its success upon the formation of a sensitive surface of phosphate of silver (a salt almost as sensitive to light as chloride of silver), which is, after being impressed by light, fixed by soaking in a solution of phosphoric acid, which has the property of dissolving phosphate of silver as readily as hyposulphite of soda dissolves chloride of silver. The theory of the process is perfect, and the results are quite as good as are obtained by the ordinary printing process; whilst the manipulations are no more difficult. The only point to be observed is to be careful that none of the solutions contain chlorides, this, however, is not a matter of difficulty. The necessity for the presence of hyposulphite of soda, that bane of all photographers, is also obviated, and when there is so strong presumptive evidence, not to say certainty, that to this salt we owe nine-tenths of the "dissolving views" which meet the eye on turning over a portfolio of photographs, a process which enables us to dispense entirely with hypo in any shape or form, undoubtedly deserves more notice than has hitherto been accorded to it. We have frequently had occasion to test the good qualities of this method of printing, and we think that it will confer a benefit upon our readers if we enter somewhat into the details of the manipulations.

The paper is prepared in the first place on a bath of phosphate of soda; for this purpose Mr. Lyte recommends the common phosphate; this, however, we have shown in our previous article to be inferior to the triphosphate of soda. This may be used either with or without albumen. For a salting bath with albumen, take

Tribasic phosphate of soda	... 10 drachms
Acetate of soda	... 5 ,,
Sugar of milk	... 1 ounce
Albumen	... 10 ,,
Water (distilled)	... 10 ,,

The first three bodies are to be dissolved in the water, then mixed with the albumen, and the whole beaten to a froth, allowed to settle, and strained off. The paper is to be floated on this bath exactly in the ordinary way, and then suspended by a corner to dry. We do not, however, recommend that albumen be employed in this process, as it always contains chloride of sodium, the ill effects of which will be pointed out subsequently. The bath which we have found to give the best results, is composed of—

Tribasic phosphate of soda	... 1 ounce
Rochelle salt	... ¼ ,,
Sugar of milk	... 1 ,,
Gelatine	... ½ drachm
Water	... 1 pint.

The gelatine is first to be dissolved in a little of the water, made hot, and the other substances finely powdered, and dissolved in the remainder of the water, and the two solutions mixed together. Filter into a dish, and float the paper as usual. As soon as the paper has become sufficiently damp for it to cease to curl upwards, remove it, and allow it to hang by one corner till dry. The silver bath is composed of—

Nitrate of silver	... 1 ounce
Distilled water	... 5 ounces
Acetic acid	... 5 minims

Sensitize as usual, and when dry expose under the negative in the printing frame. The exposure must be carefully regulated, and the picture removed from the frame as soon as the desired intensity of colour is attained, for it is important to be remembered that in this process the picture loses scarcely anything by fixing, so that an over-printed positive cannot be toned down in subsequent baths, without considerable difficulty. When the picture is printed to the requisite depth, it must be soaked for ten minutes in a dish of pure distilled water. It must then be transferred to the fixing bath, which Mr. Lyte prepares by adding nitric acid to phosphate of soda. His formula is as follows:—

Phosphate of soda . .	... 13 ounces
Water	... 42 ounces
Nitric acid (sp. gr. 1·32)...	... 8 ounces.

But we do not consider it advisable to form an extemporaneous phosphoric acid bath in this way, as the reaction of the nitric acid on the phosphate of soda would not (according to the best chemical authorities) completely liberate the phosphoric acid, but would form a mixture of phosphoric and nitric acid, phosphate of soda, and nitrate of soda. This phosphoric acid bath being capable of being restored to its original efficiency when exhausted, with very little trouble, it is far better to commence with a pure liquid at once, especially when phosphoric acid is so readily made. The plan which we have found to answer best, is to take one part of glacial phosphoric acid (which may be prepared by either of the methods already detailed), and dissolve that in twelve parts of distilled water. In this bath the proofs are to be soaked for five or ten minutes, or until all the yellow colour has perfectly disappeared from the undarkened parts of the picture, which should be left perfectly white. The proof is then to be transferred to pure water, where it must be allowed to soak, with frequent changes, until all the silver salt is dissolved out, which may be ascertained by allowing the proof to drain into water, containing a little common salt dissolved in it. If there is produced a white turbidity, the washing has not been continued long enough, and the print must be soaked again in pure water. When washed, the prints will be perfectly fixed, but will be of an ugly red colour; they must, therefore, be allowed to soak for a few minutes, in a colouring bath, composed of—

Chloride of gold	... 15 grains
Common salt	... 3 ,,
Water	... 30 ounces.

This bath will be found to colour the proofs very quickly. When they are of the requisite tone they may be removed, and after being washed in plenty of common water are ready to be dried. In practice this process will be found to possess great certainty, and is not at all complicated or tedious in its manipulations. The chief precaution which must be taken in order to secure good results, is to guard against the presence of chlorine in any of the preliminary baths before toning. Chloride of silver being insoluble in phosphoric acid, it is evident that if any chlorine compound finds its way into any of the baths in which the paper is soaked, chloride of silver will be precipitated on its surface, and will there remain unaffected by any of the subsequent operations. The ill effects of a neglect of this precaution are not, however, nearly so serious as imperfect removal of the hyposulphite of soda is in the ordinary process. In the former case the worst that can happen is a slight darkening of the lights of the picture after prolonged exposure to light, while in the latter case the picture fades altogether from the sight. The phosphate of soda bath must especially be tested for chlorine by adding nitrate of silver to it, and then an excess of nitric acid. If the precipitate which is formed in the first instance entirely dissolves upon addition of the acid, the bath is free from chlorine; the fixing and washing baths should be similarly tested.

When the phosphoric acid fixing bath is saturated with phosphate of silver, it may be restored to its original efficacy in the following manner:—Pour about three fourths of the liquid into a glass vessel, and add to it carefully hydrochloric acid. This precipitates the silver in the state of insoluble chloride and sets free the phosphoric acid again. The hydrochloric acid must be added gradually, and its addition stopped as soon as it ceases to form a precipitate. The remaining fourth of the old fixing solution is then to be poured in, and the bath after filtration will be fit to use again. The reason of keeping back a portion of the fixing bath is to avoid the possibility of having any unprecipitated chlorine in solution. If by chance a little excess of hydrochloric acid has been added to the larger portion of the liquid, it will be all precipitated upon addition of the small quantity kept back.

We have in the above sketch only given the more important particulars of this process; the details will be readily filled in by any skilful operator. Pictures printed in this manner have stood tests which very few silver prints would pass through uninjured, and from nearly six years experience which we have had of prints so prepared and fixed, they may be considered as far surpassing chloride of silver proofs in stability, if, indeed, they are not absolutely permanent.

MY IMPRESSIONS OF PHOTOGRAPHY IN PARIS; AUTUMN, 1861.*

BY C. JABEZ HUGHES.

There are two methods of examining the condition and progress of photography. The one, by estimating it from the examples seen in artists' galleries and specimen cases; the other, from those shown in the periodical and special exhibitions. The former will, doubtless, show the truest picture of the art as it is daily practised, and as the world generally knows it; while the latter will exhibit it in its highest excellence, and latest degree of novelty.

The every-day character of Paris photography was sufficiently alluded to in my last; its condition, as indicated in this year's Exhibition, will form the subject of the present paper.

As this Exhibition was in many respects much superior to any we have had in this country, a few words may not be out of place as to its general character, before it is alluded to in detail.

In the first place, there was abundance of room and an excellent light. A gallery of the *Palais de l'Industrie* was devoted to it, and it was a great pleasure to examine the pictures without going on the knees on the floor, or straining the neck by looking up, most of the prints being placed on the level of the eye. As our exhibitions in London usually take place in winter, and in rooms not well lighted, our pictures are principally seen by gas-lights. This latter is very deceptive in judging of the tones of prints. Many pictures of suspicious sulphury tone, of objectionable foxy tint, or of detestably slaty hue, when viewed by strong artificial light, receive a degree of credit for goodness which would certainly be denied in broad daylight. Good photographs never need the aid of artifice, and only inferior ones are improved by temporarily assuming the charms they have not. It was, therefore, very pleasing here to judge the large collection of choice prints in broad daylight, noting all the most delicate gradations of tints and tones, and thus mentally according that degree of praise to each artist as they approached one's own ideal of excellence.

The collection was very large—over two thousand—and principally contributed by French exhibitors. I should have liked to have seen more of our English pictures, especially from our landscapists. One good thing I hope our 1862 International Exhibition will do—make the clever artists of different nations better acquainted with each, so that they may more often exhibit their best examples side by side in each others countries. I hope, also, the getters-up of the future Photographic Exhibitions will deem it part of their duties to put themselves in communication with the gifted of other lands, so that all may derive a greater benefit from these annual gatherings, and that, at least, our own exhibitions may have infused into them a little more of the cosmopolitan character. I write thus, because, popularly speaking, we know so little of French photography, and because I feel that if we had more knowledge we should esteem our Gallic brethren better, and be more stimulated to excel, from observing the high point they have reached.

The landscape portion of photography was decidedly deficient in quantity and quality; and though there were many good pictures, the majority had the same faults that existed in our pictures three or four years ago, and which have since been so much amended. White paper skies, black trees with little detail, heavy shadows without transparency, water without liquidity, when tranquil, looking like chalk, and when in motion, like cotton wool. Above all, there was wanting in these landscapes that one thing, which constitutes the very soul of an open-air picture, atmosphere. In the introduction of this great requisite into their more recent works, consists the improvement of our English masters; but the craving for it has always existed amongst us, and the only question has been, how best to obtain it. Early calotype prints were valued because they suggested it, and dry plates denounced because they did not supply it, and to Mr. Mudd is the great credit awarded, that, even with dry plates, he was one of the earliest to obtain it.

Assuming then that I am correct, that the English have a keener appreciation of the beauties of aërial effects than their French brethren, (and their neglect of this class of work generally, and their frequent deficiency when they attempt it, gives me ground for the assumption,) I ask what can be the reason? That it is certainly from no inability to produce softness, their other pictures shew; and it can scarcely arise from deficiency of perception where delicacy should predominate, for nothing requires for its proper delineation so much exquisiteness of half-tone as the human head, and in portraits having this very pre-eminence they undoubtedly excel.

I have a theory to explain the anomaly by supposing that it arises from the difference of the atmosphere of the two countries; that in the dry, clear, smokeless atmosphere of France, and Italy too, there is much less than in this country, of that gauzy, fleecy vapour resting upon and overhanging and slightly enveloping all objects, particularly at a distance. I think that in our humid climate the clouds usually rest lower, are more abundant, and invest the scene with their character in a higher degree than in those countries. To this is due the fact that the atmosphere plays so important a part, and is so large an element of beauty in all our landscapes. Therefore no representation however executed is ever perfect unless this peculiarity is duly represented. So long, therefore, as our photographs ignored these aërial effects they were defective. Not only, however, do these beauties of atmosphere exist in an exalted degree in our landscapes; but there seems a peculiar fitness in our people to represent them—a sort of *genius loci* that qualifies our artists for delineating them. For many years our figure and historical painters have been working hard but making little headway, while our landscape painters have taken rank at once and continue to hold their own against all comers. In like manner, and by the harmony of analogy, while English photographers have not made such strides in portraiture, as this Exhibition clearly shows, our landscape photographers, true to their national instinct, are able to take the highest grade in their peculiar vocation. It would seem in peoples as in individuals that no one can be equally great in all things. There are no Admirable Crichtons among nations. If to the English be yielded the palm of landscape work, that of the figure must be given to the French. The landscape may have its charms, but it is too quiet and tame for the Frenchman. He delights in life, he is full of vivacity himself, and must have vitality in his subject. Look around at this Exhibition, the human figure is seen everywhere. In all sizes, forms, proportions, positions; priest and king, noble and beggar; turn which way you will, draped and undraped, in fancy and plain costume, sent by professional and amateur, it is constantly the human figure. After this, perhaps, the next most

* Continued from page 590.

numerous are the copies of works of art,—paintings, engravings, and statues, being the principal. Here, again, this passion for depicting the human form is repeated—for few subjects are painted but those that prominently represent the human figure, either in love, in battle, or religious exercises. These three conditions, variously modified, form the subjects of nearly all the pictures, engravings, and statuary. In English photographic exhibitions the portraits are usually voted a bore, and rarely form more than about one-fourth of the whole, but here there are portraits everywhere. All the dignitaries, artists, actors and actresses, editors, musicians, seem to spend much of their time in photographic *ateliers*, judging by the abundance of their portraits. There is this peculiarity, however, about the numerous portraits, that they are all interesting. It is either some distinguished person, or a popular actress in some fresh character, or there is a reason of some sort why they are there, and not simply a "portrait of a gentleman;" this, therefore, relieves what would otherwise be monotonous. Then the styles of the different photographers are so very varied, their posing so different, the arrangement of drapery and accessories so bold, original, or bizarre, that one can scarcely get tired of them. This one will produce scarcely anything but very large heads, that one makes full lengths, another has only distinguished generals, the next, perhaps, only popular performers, and so on. Properly speaking, it is not therefore so much a collection of portraits, as actually studies of the human figure, under a thousand varieties of form, expression, and costume. Our French brethren must fully appreciate Pope's line—

"The noblest study of mankind is man,"

for, at least artistically, study hard how to delineate him in every variety of manuer.

(*To be continued.*)

BURNT-IN PHOTOGRAPHY.*

BY MICHAEL HANNAFORD.

A HINT might also be got from the methods of making paste diamonds. A *flux*, or, as it is more generally here termed, *strass*, is first made, and charged with metallic oxides, as in the case of enamelling.

The following is a good recipe for preparing strass:—

Rock crystal, 1,600 grains; *borax*, 560 grains; *carbonate of lead*, 3,200 grains; oxide of manganese, ½ to 1 grain. Powder each separately, mix, and fuse in a crucible; pour the melted mass into water, separate any reduced lead, and again powder, and re-melt the mass.

As it may be desired to imitate the colour of some of the precious stones, we give the formulæ for a few of them:—

AMETHYST.—(1) *Strass*, 500 grains; *oxide of manganese*, 3 grains; *oxide of cobalt*, 2 grains. (2) *Strass*, 4,600 grains; *oxide of manganese*, 36 grains; *oxide of cobalt*, 24 grains; *purple of cassius*, 1 grain.

CORNELIAN (RED).—*Strass*, 7,000 grains; *glass of antimony*, 3,500 grains; *calcined peroxide of iron*, 875 grains; *binoxide of manganese*, 75 grains.

EMERALD.—*Strass*, 7,000 grains; *carbonate of copper*, 65 grains; *glass of antimony*, 7 grains.

GARNET.—*Strass*, 1,200 grains; *glass of antimony*, 580 grains; *purple of cassius and binoxide of manganese of each*, 3 grains.

OPAL.—*Strass*, 960 grains; *calcined bones*, 48 grains.

RUBY.—*Strass*, 45 parts; *binoxide of manganese*, 1 part.

TOPAZ.—*Strass*, 1,000 grains; *glass of antimony*, 44 grains; *purple of cassius*, 1 grain.

TORQUOISE.—*Blue paste*, 20 to 25 parts; *calcined bones*, 1 part.

Probably, for our purpose, it would be better to reduce the quantity of strass very materially, so as to get a tone sufficiently deep when only placed on in a thin layer.

By either of the above methods we may produce a compound which can be ground to powder in a mortar, and used as "enamel colour" in Joubert's process.

In the number of this journal, of the 15th ult., a process by W. J. Miers, for obtaining glass positives in gold, is given as an extract from the *British Journal*. He flushes a positive or negative with chloride of gold until maximum intensity is obtained. The plate, washed, is immersed in dilute nitric acid for a short time, then rinsed and treated with a strong solution of ammonia. This alternate application of nitric acid and ammonia repeated three or four times clears off all visible traces of the silver forming the image at the commencement, leaving a picture in gold which may be burnt-in.

The use of salts of some other metals might be tried in lieu of gold, in which case the application of nitric acid and ammonia would have to be omitted or modified.

An article on enamelled photographs, by M. A. Lafon de Camarsac, from the "Comptes Rendus," of June 11th, 1855, is given in the *Journal of the Photographic Society*, for September 21st, 1855. He operates on black and coloured grounds, as well as on white, or on transparent glass. On the dark foundations the lights of the image are obtained from reduced silver formed by developing the image in the ordinary manner until the half-tints are overdone and obscured, and the deep shades covered with a thick deposit presenting the appearance of relief. The fire cleans the image and restores all its delicacy. On white porcelain, or enamel, or on transparent glass, the deposit of silver is treated with solutions of salts of tin, salts of gold, or salts of chromium, by which means he obtains various colours, very vigorous when removed from the muffle, and presenting a peculiar semi-metallic brilliancy. A very thin layer of an appropriate and very fusible flux fixes the image on the ground.

He also produces pictures in a rather singular manner by the action of light on the salts of chromium mixed with gelatine. The exposed plate is washed in water and then placed in a muffle so as to destroy the gelatine by heat, the metallic deposit alone remaining on the plate. This is now treated with the salts of gold and of tin, &c., as above, and after being covered with a layer of flux, it is again subjected to the influence of heat.

The resins afford him the means of obtaining pictures in much the same manner as in Joubert's process. Bitumen of Judæa dissolved in essence of turpentine, with the addition of resin, after being influenced by light is no longer acted on by the solvent; exposure under a transparent positive, and a short subsequent treatment with turpentine, gives a sticky image as in Joubert's case, and enamel colour may be applied in like manner.

Some of the photo-lithographic processes could be made available for our purpose. Perhaps that of Colonel James would serve well for obtaining copies of engravings, &c., in form for burning into ceramic ware. The image might be produced in paper in the same menner as if it were to be transferred to stone, some compound containing oxides being substituted for grease.

Having recently been engaged in experimenting in this direction, so far as photo-lithography is concerned, we will put our ideas, founded on those experiments, in a tangible form. The sensitizing solution is made thus:—

Albumen	3 ounces
Gum arabic solution of about the consistency of albumen ...	1 ounce.
Bichromate of potash to saturation	

Float paper on this in the usual manner, and if the solution should not flow evenly, add a little water. The coating should, however, be of considerable thickness. Then dry—of course in the dark—and expose in the pressure frame under a *very* intense negative. The time of exposure will be rather less than for silver prints, and the image will appear of a dark brown on a yellow ground. In the photo-

* Continued from p. 588.

lithographic process the paper at this point is coated with printer's ink; but in the present case we require the print in some vitrifiable pigment and so must manufacture one for our purpose. A varnish used by lithographers for mixing with dry colours will serve our purpose for mixing with any of the previously enumerated metallic oxides so as to form a thick creamy paste with which to cover our paper by means of a dabber. Soaking in water and the application of slight friction will remove the compound from those portions which have not been acted on by light. We thus obtain a picture, in any pigment we please, in a form ready for the potter's hands. This method will not, however, give us half tone; but for copies of engravings, &c., we have not the slightest doubt it would be found to answer admirably.

Prints on paper can also be obtained in one or other of the numerous processes for printing in different metals which have been given from time to time. And here we have no difficulty on the question of half tone.

Some of the processes suggested by Mr. Burnett would no doubt answer for this purpose; of these perhaps the best is the chromatype. A paper is coated with bichromate of copper, and well washed after exposure to remove the sensitive material from the parts which have not been acted on by light, when an application of yellow prussiate of potash gives a red brown picture. Several other methods which, unfortunately, he has only roughly suggested, could no doubt be worked out. The bichromates afford an extensive scope for experiment.

An iron printing process that we published a few years back, would also enable us to obtain pictures that could be transferred to articles in earthenware. At this moment we have by us some of these prints so deeply toned with gold that they present quite a bronzed appearance. They were produced as follows:—

Paper was floated for about one minute on a sensitizing solution, composed of

Albumen	two parts	1 oz.
Water	one "	
Ammonio-citrate of iron ...	50 grains	
Bichromate of potash	saturation.	

Exposure under a negative, and subsequent washing in several changes of water, gave a yellow brown picture on a white ground. Rather a strong solution of chloride of gold, say two or three grains to the ounce, was next poured over the print, which, after being again well washed, was treated with a solution of gallic acid. The image now appeared composed of gallate of iron, with quite a thick deposit of gold. One of these prints we have just placed in dilute nitric acid to dissolve out the iron, and the result is that a strong image in gold remains. Another print, untoned with gold, placed in the acid at the same time is entirely discharged from the paper.

But we can tone the photograph with other metals beside gold. For instance, a solution of sulphate of copper applied instead of the gold, coats the image with a thick layer of that metal in a few seconds.

We feel assured that experiment in this direction will be well repaid.

A little careful manipulation will enable us to obtain these prints on glass. To this end, coat a glass plate with the sensitizing solution, and, after exposure, pour over it alcohol containing a very little acetic acid; or, perhaps better still, a strong solution of sulphate of iron. Wash, and proceed as before.

As to the colours to be got by the methods we have suggested above, although a reference to the process of enamelling given in the first portion of this article may be some guide, yet we should not like to speak with confidence thereon, until we have tried the test of experiment.

Generally speaking, there is less difficulty in producing the image for fixing than in actually burning it in. The readiest plan is to have a kind of dish of sheet-iron constructed. It should be three or four inches deep, with the bottom slightly rounded, so that the glass plate may touch at the ends only, and if it has a cover all the better, as the cooling can then be better regulated. In an apparatus of this kind a plate will soon be sufficiently heated over an ordinary fire.

But to produce the best results with any degree of certainty, it will be necessary to hand the prepared plate over to the glass manufacturer to be placed in a muffle and passed through the furnaces in the ordinary manner—a process which takes three or four days in its accomplishment. Some time back a friend offered us such a facility, but at that time experiments in another direction claimed our attention. Now, however, we may probably remind him of his offer, and place the results of our experiments before the readers of this journal.

Critical Notices.

THE PHOTOGRAPHIC NEWS ALMANAC; or, The Year-Book of Photography for 1862. London: Photographic News Office, Paternoster Row.

We cannot, for obvious reasons, enter into much critical examination of this work, nor, however highly we may think of it, can we, with any propriety, enter into commendation of its worth. We may, however, for the benefit of those of our readers who are interested in the matter, briefly state the character and contents of our Year-Book, and the aim we kept before us in compiling it.

An almanac is in its own nature always a book of constant, almost daily reference, and we have endeavoured in our Photographic Almanac to include, not only a calendar for the year, and all the usual information which constitutes almanacs generally useful, but have added everything we thought likely to be of service for constant reference in the photographer's daily practice. Members of societies will find their meetings duly indicated in the calendar opposite the date; whilst lists of officers, &c., are detailed on another page.

The Annals of Photography for 1861 contain an epitomized photographic history of the year up to the period of our going to press. We have given in a series of articles a careful digest and re-statement of the processes in everyday use, in which the formulæ and manipulations are based upon our own experience, and that of many of the best photographers of the day, with whom we have personal communication. These articles include the following subjects:—Iron Negatives: How to Produce them, and the Proper Conditions of Delicacy and Brilliancy. Modes of Developing; Intensifying Processes; On Printing, Toning, and Fixing; On Mounting Photographs; and Collodion Positives. A series of brief articles include Hints on Landscape, Marine, and Instantaneous Photography; on Portraiture, and on Album Portraiture; on Enlarging and Copying; and on the Solar Camera. A brief, but complete statement of the new and modified processes of the past year follow; and also a statement of formulæ and manipulations of the chief Dry Processes at present practised. Various useful tables, and other useful matter complete the work. How all this is done, we invite our readers to ascertain for themselves.

CROGER'S POCKET METRONOME. 483, Oxford Street.

We have received from Mr. Croger one of his convenient little pocket metronomes, or seconds apparatus. It is a very simple and convenient aid to marking time in the operating room, as a guide for exposure. Many operators are in the habit of counting the time: such a plan is very uncertain, as the state of health, or excitement, and a variety of other circumstances, will vary the rapidity of the counting. Some definite method should be adopted, and Mr. Croger's pendulum is one of the simplest and most certain that can be used.

THE LATE PRINCE CONSORT.

Although not strictly within the province of a scientific journal to refer to the late national bereavement in its national relation, we cannot avoid expressing our deep sense of the loss sustained by photography, in common with art and science generally, of which His Royal Highness, the late Prince, was such an active and constant patron. It is, perhaps, impossible to estimate his influence in the advancement of art culture throughout the kingdom during the last twenty years, and his most enduring monuments will be found in the various institutions for art education, which owe their existence, not only to his suggestions, but to his unvarying personal effort and fostering care. As most of our readers know, he had not only a high appreciation of their art, but a technical knowledge of its practice, and was directly connected with photographers generally as patron of the Photographic Society of London. We must forbear, however, in these pages from anything beyond expressing our deep sense, as photographers, as well as subjects, of this heavy national sorrow.

PANORAMIC PHOTOGRAPHY.

BY THOMAS ROSS.*

I have this evening the pleasure of laying before the Society a complete set of the apparatus necessary for the production of panoramic photographs 10 inches in length, and including an angle of upwards of 100 degrees.

The set of apparatus consists of a plate box for one dozen plates, a holder for the curved plates while being cleaned, a water-tight bath with dipper, a camera with lens and tripod-stand, and a printing-frame, all packed in a varnished pine case with handles, and secured with lock and key.

The plate box has slanting grooves suitable for plates of the required curve.

The holder for cleaning the plates consists of a flat base-board, surmounted by a curved board lined with cloth, to prevent the glasses from breaking or being scratched. At one end of the board is a fixed overlap of wood for the plate to rest against; at the other end is a hinged flap, which enables the manipulator to clamp the plate safely and securely whilst it is being cleaned.

The bath, which is made of gutta-percha, is curved rather less than the plates for which it is required, to prevent the collodion film from being injured during immersion. The bath is rendered water-tight by means of wooden top lined with india-rubber, firmly compressed to it by three brass clamps. There are occasioual objectors to the use of gutta-percha baths; but, in order to meet the wishes of these objectors, I am in treaty with a manufacturer for the production of curved glass baths; these will, of necessity, be more costly and more weighty than gutta-percha ones, to the latter of which I must confess I see no objection when they are made of pure material.

The plate-dipper, which has the form of an enlongated horseshoe slightly hooked at the extremities, is made of strong metal wire, thickly coated with gutta percha. A dipper made of pure silver, or of brass wire thickly electro-plated, might be employed if preferred.

The stand is the usual folding tripod, with triangular brass top, to which the camera is fixed by a bolt passed through the camera and clamped under the triangle.

The printing-frame differs from ordinary frames in its being curved, and in its having inner shoulders thickly lined with india-rubber upon which the negative plate rests. The back-board, which is hinged in the middle, presses three or four thicknesses of soft pliant flannel against the excited paper, and is kept in position by two strong springs in cross bars, hinged at one end and hasped at the other. With this as with the flat frame, the operator may with the greatest facility examine the progress of the print without the least danger of displacement.

The camera and lens require a more minute description, which will now be given in detail.

The camera has a sliding body, which is adjusted by a screw motion at the back, and secured in adjustment by a clamping screw on the top of the camera. As it is important to place the camera parallel to the plane of the horizon, two spirit-levels, placed at right angles, are fixed in the top of the camera: by this arrangement the camera may be placed in a proper position with more facility. The camera has a sliding front, to which is attached a square box with a hinged shutter fitted with a clamping screw. This shutter, which acts as a cover to the lens, may be used both for instantaneous photography and for regulating the amount of exposure required by different parts of the subject: it acts as a shield to the upper portion of the lens, and may be made to obstruct the rays from the sky, thus enabling the operator to produce fine effective clouds on a sufficiently exposed plate. It is scarcely necessary to state, that both the plate-holder and the ground focussing-screen have the exact horizontal curve of the field of the lens.

I now come to the description of the lens, which is unquestionably the most remarkable part of the apparatus; and I think I cannot do better than quote the words of the inventor, Mr. Sutton, as contained in that portion of his specification which relates to the form of lens which I have the honour of exhibiting this evening.

"My invention relates to the construction of a compound achromatic lens for taking photographic pictures wherein au unusually wide angle of view or extent of field is to be included. The compound lens is composed of two single, thick, concavo-convex lenses made of glass, the curved surfaces of which are portions of concentric spheres. They are secured to a suitable mount in such a manner and position that the curved surfaces of both of them (that is to say, all the four curved surfaces) are concentric, their common centre being a point in the axis of the compound lens, and the lenses having their concave surfaces opposite to each other. In the space or cavity between the concavo-convex lenses is contained a transparent fluid of lower refractive and dispersive power than the glass of which the lenses are made. Water is a suitable and convenient fluid to employ. By assigning proper radii to the surfaces of the glass lenses, the compound lens is rendered achromatic and convex, so as to produce real images of objects. The two glass lenses may be made of the same kind of glass, and equal in all respects, but that is not a necessary condition. By using lenses made of different kinds of glass, and giving their concentric surfaces suitable radii computed according to known principles of optics, the compound lens can be made achromatic, and at the same time its spherical aberration can be reduced. The compound lens is provided with a central diaphragm, having a central circular aperture of suitable size in order to give sharp definition when objects at different distances from the lens are included in the view. This diaphragm is placed between the lenses and within the fluid in such a position that the centre of its circular aperture is at the commou centre of the spherical surfaces of the lenses."

The description of the diaphragm (so very insufficient in the specification) I shall give from Mr. Sutton's paper read at the last meetiug of the British Association, held at Manchester in September last:—

"The central diaphragm is another curious part of this instrument. It is evident that, if it were merely furnished with a central circular hole, the sides of the picture would

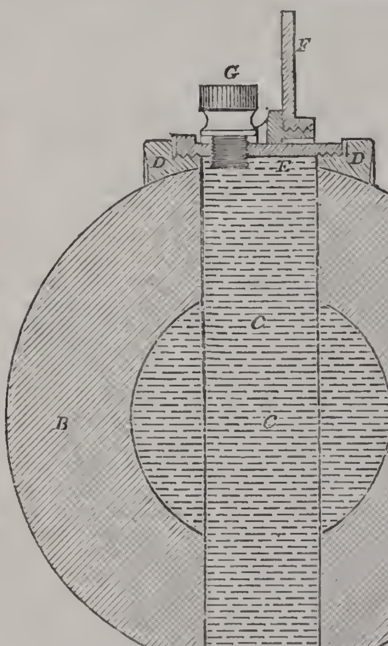
* Read at a Meeting of the Photographic Society, on the evening of Tuesday, December 3rd, 1861.

be less illuminated than the centre. To meet this inconvenience I have made the central hole elliptical, and have placed in front of it two upright thin partitions, radiating from the centre, and looking like the open wings of a butterfly. These stop some of the light of the central pencil, and make it cylindrical, and at the same time they make the side pencils cylindrical also, and of the same diameter as the central one. This simple contrivance answers perfectly in equalizing the illumination."

I now turn again to the specification; but may here remark, that although the lens before you is substantially the same as that described by Mr. Sutton, it somewhat differs from it in this respect, that the mounting has been improved and simplified. Mr. Sutton, describing the lens with its original mounting (a sectional diagram of which you have before you), continues in his specification :—

"Fig. 1 represents a vertical section of the simplest form (by-the-bye the best form) of panoramic lens and amount wherein the glass lenses, A, B, are both alike in all respects, and made of the same kind of glass. When this construction is adopted and the internal cavity C is filled with water, the lens will work with sufficient accuracy for most practical purposes, if the following dimensions are employed, viz., if the lenses are both composed of the same light flint glass, their inner radii may be one-half the length of their outer radii; if they be made of the same colourless crown or plate glass, their inner radii may be two-fifths of their outer radii.

"I do not confine myself to any particular form of mount, but the one shown in fig. 1 will be found to answer well in practice. According to this form of mount, each lens is fitted into a metal ring D, provided with an external screw-



thread for the purpose of screwing them fluid-tight into the intermediate ring or zone E, provided for that purpose, with internal screw-threads at each end. This zone E slides freely within the boss of the flange F, by which the entire lens is secured to the woodwork of the camera, the sliding motion serving to facilitate the adjustment of the focus. The cavity C between the lenses A, B, is filled with water, or other suitable fluid, the ring E being provided for that purpose with stoppered inlet and outlet apertures at G and H."

I will now take leave of the specification, and observe that, as the camera has sufficient screw-adjustment, a sliding adjustment to the lens became unnecessary, and has therefore been dispensed with. The stoppered apertures at G and H have also been done away with as unnecessary for filling the lens with water, which operation may easily be effected in the following manner :—

Unscrew the front component of the lens, then pour perfectly clear water into the reservoir till the water reaches the brim, and slightly agitate the water to expel the air, then screw on the front lens. The small bubble of enclosed air which has not been got rid of will rise much above the spherical concavity of the lens, and thus become of no consequence. The brass mounting is made with so much accuracy that the lens, when screwed up, is perfectly water-tight.

Some persons have supposed a certain amount of difficulty to exist in coating curved plates with collodion. There is, however, no real difficulty in the matter. If Mr. Collis will be good enough to coat before the Society a few of the curved plates I have brought with me, he will be able to show you with what facility the operation may be accomplished; and if any of the members present will try the experiment, they will find it exceedingly easy.

I beg to say, in conclusion, that I shall now have the pleasure of submitting to your inspection the first panoramic negatives taken by Mr. Harral, in order that you may judge what amount of success a first attempt may meet with.

I must apologize for again introducing some prints which have already appeared before you; but as there may be some members present who were not here at the last meeting, it may afford them some gratification this evening to obtain a sight of panoramic prints.

Those who may be further interested in this matter will find it completely discussed in the article "Optics," in the *Photographic Quarterly Review*, for June, 1860, and also in the *Photographic Notes*, of November 15, 1861, in a paper by Mr. Sutton read at the Newcastle Photographic Society.

THE NEW PICTURE GALLERIES.*

When that estimable but misguided martyr to principle, Mr. Samuel Pickwick, refused to pay the sum which the jury had awarded to the widow, and the costs of her advocates, Messrs. Dodson & Fogg, and chose that satisfaction should be given to those tormentors upon his body rather than upon his purse, the first torture he underwent in the Fleet was a characteristic one. He had to sit for his portrait. He found himself the centre of a crowd of turnkeys and jail officials, whose business it was to look him over and stare at him until they should be absolutely certain of knowing him again when present, or being able to describe him if absent. It is needless to say that the same childlike innocence and natural imperturbability which had supported the great philanthropist in other critical periods of his career—in the Village Pound, in the Justice's Hall, and in the lady's bedroom at Ipswich—enabled him to endure the consummate and final misery of sitting for his portrait in the Fleet. But the story of his endurance, as narrated by his great biographer, Mr. Dickens, we recommend to the perusal of those unhappy men who, in the present day, are perpetually being pestered and forced to have their portraits taken.

An elegantly bound album, containing some thirty or forty so-called "likenesses," has become one of the indispensable ornaments of every lady's table. Be it so: the books are pretty, though their contents may not be; and we should acquiesce in the existence of these as we acquiesce in any other fact accomplished by the despot fashion, were it not that the owners of these books are continually pressing upon us the necessity of sitting for our portrait, in order that our person, distorted by the painful process of photography, may be enshrined by the side of other victims to this rage for *cartes de visite*.

A gentleman has, perhaps, escaped for some time the effects of this epidemic, and has been exempted from the general per-

* From the *London Review*. See article on another page, "Photography and Contemporary Literature."

secution. His acquaintance, the owner of the miniature picture gallery, has apparently forgotten him, or he begins to hope that he is not considered sufficiently intimate, or presentable enough to receive a summons to that mimic court. But he is deceiving himself. The owner of the book has been busy hunting up country relations, old friends, and the rest of the elect who are to occupy the first half of the volume; and now that the tale is complete his turn is come. He has lived in freedom so far, only because he could at any moment be arrested and sent off to the executioner. He has gone loose on sufferance like a sacred ichneumon in Egypt, or a Frenchman under the *Lois des suspects:* and at last his time arrives. He is handed over to the tender mercies of Maull, and his co-operator Polyblank; or Silvy does his silent office upon him. He is seized and photographed in a trice.

Which of us is so fortunate as not to be able to recall sufferings in the Inferno of some eminent photographers? to recollect how, while waiting our turn to pass into the dusky abodes beyond, we surveyed, in all the misery of protracted anticipation, the shadowy forms of those who had before passed under the operation; searching, like bereaved relatives in a Morgue, for the disfigured appearance of a friend. We had no difficulty in recognizing one when found. Hideous as he may have seemed, the operator had left him enough of his former self to enable us to appreciate and lament the change. Like Æneas we recognize our Hector—

> "And weep to see the visionary man;"

or, like him, we mourn over our Deiphobus—

> "Whose face and limbs are one continuous wound.
> Dishonest with lopped arms the youth appears,
> Spoiled of his nose, and shortened of his ears."

A photographic likeness cannot be true, as will appear from the consideration that it is the result of one momentary isolated impression, and not a careful generalization. If a person who had only known us for one day were to undertake to draw our character, the odds are as Lombard-street to a China orange, that he grossly misrepresents us. Or, again, if he were to describe the our person, dwelling almost entirely on one feature, or one attitude or habit, we should complain of being caricature. And this is the inherent fault of which we accuse photography; it caricatures.

A good portrait-painter studies carefully the subject of his picture, endeavours to live awhile in his company, draws him into frequent and free conversation, marks his habits and looks under various circumstances, gathers up all the particulars of his individual appearances, and then unites and combines them in one great general resemblance. It is true, indeed, that some painters are prone to over-generalization. It does not do to refine away all excrescences until you get a perfectly smooth and polished surface, because by this process character and truth will be as much sacrificed as in the instantaneous impressions of photography. But it is only when generalization passes into idealism that this evil can occur; whereas the impressions of photography, like all first and sudden impressions, are always only half-truths. A "pistolgram," as these rapid portraitures are now (especially when the subject is an infant) designated by the faculty, is taken, the subject is flashed upon paper, a momentary appearance is produced, and the result is invariably more or less a caricature. This view is borne out by the fact that the photographs of men are generally much more tolerable than those of women. Men with their hard outlines, decided carriage, and natural lack of gracefulness, are better subjects for offhand portraiture than women. There is nothing decided about a charming woman. She is, in appearance, what Sir Walter affirms she is in character—

> "Variable as the shade
> By the light quivering aspen made;"

and how can photographers hope to give any imitation of the subdued and softened qualities which Nature has so artfully fused, so skilfully combined in her? Her outward visible form requires just as much study to be appreciated as her inward graces; and this study is just what the photographer cannot give her. We wonder what Wordsworth would have thought of one of these modern representations of his "phantom of delight," or Coleridge of his Genevieve? and then to see the portraits of these fair creatures on a hundred drawing-room tables, or in a dozen shops, as common and as vulgar as clowns at a Bartlemy Fair! Almost all have a cast in the eye. Others have either an unmeaning grin, or a silly smile, or a surly frown that Timon of Athens might have envied. One young lady looks saucy, another as melancholy as Mariana in the moated grange, another has such a dangerous look that Petruchio himself would not dare to marry her. With these defects in themselves, the figures stand or sit in the centre of a perfect chaos. Panels of walls, doors, jars of conservatory flowers, tables, and other articles of furniture, lean, roll, and tumble about the apartment, as if spirit-rapping was going on, in every position out of the perpendicular. The central figure may be in focus and straight, but if even she escape with no distortion, such as a monster hand or foot, or a cheek that seems afflicted with the mumps, all her *entourage* is reeling around her, as if she had been taken in the saloon of the big ship during the great storm.

Women are, as we have said, the chief sufferers from this pictorial misrepresentation. But we cannot pity them. They are also the chief maintainers of this, as of every other troublesome fashion. We have no doubt a woman would rather be represented by a good oil-painting, but, failing that, she offers herself to the photographer. Most women would rather endure any misrepresentation than no representation at all; just as they would rather see their faces in a broken glass than in nothing. Like Narcissus, the fair one is injured by love of her own form, and then naturally enough wishes to inflict the same fate on others. A photograph book is given her by some gentleman in exchange for her likeness, which has just been taken by Silvy or Southwell. This may be multiplied to any extent, and every man who is in the original owner's set at Trinity or Christ Church may be favoured with a copy.

Women are not, therefore, to be pitied. If it pleases them to be so bandied about, it cannot hurt us who are of the vulgar sex. Only let them leave those in peace who object to their distorted limbs becoming public property, and cease to force into the photographers' studies men who, like Plato's philosopher, seek to pass through life in honest and safe obscurity.

Proceedings of Societies.

South London Photographic Society.

The ordinary monthly meeting of this society was held in St. Peter's Schoolroom, Walworth Road, on the evening of Thursday, December 12th, Mr. Sebastian Davis in the chair.

Mr. G. Wharton Simpson handed to the society a series of fine photographs of Hereford Cathedral, and other subjects, which were presented by Mr. Warner, of Ross, one of the provincial members of the society. He also presented from the proprietors of the Photographic News a copy of their almanac for the coming year. The thanks of the Society having been recorded for these gifts,

Mr. Wall Honorary Secretary then said: since our last meeting, the committee which our recent memorial to the commissioners suggested, has been appointed; and consists of Mr. Peter Le Neve Foster, the Earl of Caithness, Mr. Kater, and Dr. Diamond. With regard to the first-named, doubtless very able and energetic gentleman, it is hardly to be hoped that with so many other branches of the department entrusted to his care, occupying his time and attention, that he will have much of either to spare for photography. With reference to the Earl of Caithness, I remember an excellent letter in one of our photographic journals, I think the News, in which a writer, signing himself "Progress" asked the reason why this same nobleman should be entrusted with a share in the management of the Photographic Society of London, inasmuch as he (Progress) had never heard of any one thing the Earl had done expressive of any peculiar aptitude for such a position, or of any particular interest he (the Earl) had ever evinced in the advancement of "the art and science of photography." Now the Earl of Caithness may perhaps have done good work for the art *in secret*, but although *he* might blush to find it fame, I think it is *now* high time, when he fills a position so vitally important to the interests and welfare of English photography, that *we* should all demand to know something about it, as otherwise we might be unfortunate enough to suspect that there was a greater love of aristocratic fellowship than photographic welfare, and more respect for big names than great duties, in this possibly very worthy and highly intelligent nobleman's appointment. It really makes me, personally, quite feverish to see such great interests trifled with, so imprudently, while those so seriously concerned stand idly and supinely by. From all quarters, and in almost every section of the press, daily, weekly, monthly, and quarterly stray fears have recently either found definite utterance, or dim foreshadowings with regard to the position which English photography, will occupy when contrasted with its foreign rivals. Now were photographers only true to themselves and to their art, we should have nothing to fear, we have in this country, I confidently believe, some of the best photographers in the world, I say it fearlessly, but John Bull always had, from the earliest times, a strange prejudice in favour of foreign artists, and never did believe very firmly in prophets of native growth. As an instance of which, I might point to a paragraph in the *Daily Telegraph* respecting a fabulously valuable lens used by a famous French photographer, the possession of which being due to government aid, gave him advantages which no English operator could command. Knowing all about these matters we may laugh at this, but there is in it much matter for serious consideration. Such things show the way that wind blows, which may, if the interests of the art be not sufficiently cared for next year, carry away the patronage to which it owes both its present position and future prospects.

Perhaps I may be permitted to ask why "the Parent Society," to use a term now generally adopted, although confessedly inappropriate, (inasmuch as no other society was ever, I believe, indebted to it, in any single case, either for existence, assistance, or encouragement), why the Parent Society, having so resolutely pledged itself to render Her Majesty's Commissioners *no assistance*, have at the eleventh hour suffered four of its chief officers to undertake the very duties it so resolutely, not to say obstinately, declined accepting. What is there to justify this odd change in the society's intentions? Dr. Diamond informs us that when he was requested to act as one of the committee in question, he consulted—not the council and officers—but the president of the society "as to how he should act," and that the Lord Chief Baron said "he thought it was desirable, now that the society had made their protest against what they conceived was an improper classification—that *they should aid the Exhibition to the best of their ability*." This is doing at *last* the very thing this society suggested doing at *first*. But what remains to account for the waste of so much invaluable time? Could not the Parent Society have done under protest last May what it is now doing with such ill grace in December? or was it absolutely necessary to prove how actively (?) this so-called Parent Society undertakes the duties of its position, and how wisely (?) it uses the power and influence entrusted to it by photographers, that nearly seven months should elapse between making the protest and adopting a judicious course of action. In Paris we are informed the Imperial Commission proceeds rapidly "in planning out its portion of the Exhibition," and that exhibitors are being "brushed up in various ways," and urged to "make up for lost time." We hear, too, that preliminary exhibitions are already organized, in which the various objects "will be arranged in the same manner as they are to be seen eventually in London," and that "the Educational and Photographic Exhibitions are also proceeding."* Are we as active and energetic here?

It may be remembered by many how, before the Exhibition of 1851, great difficulties were experienced by the local secretaries of the various sub-committees, in inducing exhibitors to send in their goods promptly enough, and it was stated in the daily papers that in many cases the favourable aspect of various departments was *entirely* due to these "energetic agents," who had "brushed up in various ways"† the neglectful or procrastinating, but more valuable exhibitors. Who will undertake these duties for photography? Would it not be wise to entrust such to the officers of the various provincial photographic societies, as gentlemen best acquainted with the resources of their own immediate neighbourhoods in the way of works calculated to do credit to British photography, or is this also to be left to chance and accident, by which so much mischief has been already effected.

But having opened this subject, and called attention to one or two of the points which I think important. I surrender its further consideration into your hands. I have spoken out boldly, but honestly in the interests of an art to which, in connection with this society, and through other channels I have devoted a comparatively large portion of ill-spared time and labour.

One of the great French poets said, "No gentleman should neglect duties imposed by an honour which he had solicited," and every member of this society associates himself, when soliciting election as a member, with the mission for which only it was organized, viz., "the advancement of photographic art and science." I, therefore, shall not apologise for introducing these few remarks, or for placing before you their subject matter.

It is very possible that I may be both misunderstood and misrepresented, but I must risk all that, and I am content to do so. We wanted to manage our photographic affairs, next year, in connection with the International Exhibition, active, energetic, *amateur* members of our photographic societies; selected, not from their social position, or their elevated rank, but from their extended knowledge, both of the art, and its professors, that while competent to systematize, select, and arrange, they might also so judiciously allot the space at their disposal, and choose from those most competent to fill it worthily, that the result would be at one and the same time, honourable to the country, favourable to the art, and most profitable to its professors as representatives of a rapidly increasing branch of national industry and art.

The Chairman observed that it must be highly satisfactory to photographers at large that the committee had been appointed, and pre-eminently so to them as a society, as they had been the first to give a practical aspect to the question, by making the suggestion which had been adopted by the Commissioners. It was scarcely so satisfactory as might have been desired in one point; he referred to the duties being entrusted to so small a number of persons. He had hoped to have seen a committee appointed, consisting of gentlemen from all parts of the country. Regarding the allusions which had been made to the action of the society in the matter, they had not been at all anxious to take individual action in the matter; their aim had simply been to impress upon those in power that the subject was one which should not be trifled with. The credit of English photography was at stake, and with that our artistic capacities as a nation, and our reputation as scientific investigators. Photography, it had been felt, was, in the land of Talbot and Archer, peculiarly a national matter; and it became us to prove, if possible, that we were as active and capable in carrying out the practical applications of the art as we had been in discovery and theory. He trusted that the committee would not be left with the few names already published, but that more would be added, so as to give confidence to photographers throughout the kingdom. He hoped we should in the coming Exhibition, show to the world at large that English photographers regarded science and art as twin sisters, who were indissolubly united in this most attractive discovery of the last half century.

Mr. Valentine Blanchard then read a paper intended for the first meeting of the present session, but delayed, entitled "A Prologue for the Season." (See p. 592.)

Mr. Wall intimated his conviction that the educational element, in the shape of classes for chemistry, &c., scarcely came within the scope of the society, and would prove very expensive. Regarding the Experimental Committee, Mr. Blanchard had apparently overlooked the fact that three reports presented to the society last year, were the results of very many meetings. As to composing such a committee of the whole society, it already included the names of all who were able and willing to help, and of more than had done so.

Mr. Martin suggested, as a means of giving increased ease and geniality to the meetings, that the formality of rising to address the chairman and meeting, should be dispensed with. Many gentlemen might be able to offer useful suggestions, or make important remarks, who did not feel at ease to rise to do so.

Mr. Wall did not approve of the colloquial character this practice would give to the meetings.

After some further conversation on this subject, in which Messrs. Simpson, Howard, Wall, Martin, Blanchard, and the chairman took part, it was resolved that in future members should be at liberty to address the meeting without formally rising to do so.

Mr. Blanchard in replying to Mr. Wall, urged the importance of his suggestion regarding classes; he thought it would be possible to form a chemical class, which should be self-supporting, at a small expense to the members, and no trouble to the society, and the advantages of which it would be impossible to over estimate.

The meeting was then made special, to consider the propriety of securing a more central place of meeting, which should be more convenient for members and more in accordance with the

* *Illustrated London News*, 1851. † *Daily Telegraph*.

advancement and wide-spread influence of the society. After some discussion, in which the importance was urged of making no change which would be inimical to retaining the name "South London Society," to which the prestige of activity and energy attached, it was resolved to adjourn the question for the consideration of another meeting, the committee in the meantime undertaking to make enquiries and report on the subject.

Correspondence.

PHOTOGRAPHY IN GERMANY.

Elberfeld, December 12th, 1861.

Professor Roux, of Cassel, communicates in the *Photographisches Archiv* his experience with the solar camera. He has made a large camera, of 9 feet length and 4 feet high, upon wheels, of dry wood, and painted with oil colours; all can be so arranged in it, that neither the condenser, the negative, the objective, nor the paper frame can be changed in position. It is so guarded against the sun rays by large screens covered with linen, that only the reflector is exposed to the sun. Nevertheless the wood is very apt to warp. It is so arranged that the operator enters with half his body into the camera, and moves with the aid of a slider to the objective as well as to the frame. The mirror is turned from outside.

In such a small room, the heat is often so high that the paper becomes dry, and loses its sensitiveness, so that it needs several hours to take an impression. For this reason the author wets the frame to which the paper is fastened every five minutes, to render the paper sensitive. The paper should be strongly salted and sensitized in a strong nitrate bath for this purpose.

Some time ago, a photographer of Aix-la-Chapelle advertised in the journals a new invention; "Photographs without silver and gold, hyposulphite, carbon, nitrate of uranium, &c. &c." This advertisement produced great excitement amongst photographers beyond Germany and France. Some persons asked the price of the secret. It was very cheap indeed! only 50,000 francs for one country. The inventor does not yet make use of his own wonderful invention, but sticks yet to old hypo. But now comes the best. Some doctors have examined the specimens he has made of his new method, and find this is only an old and well known one, viz., gallate of iron—a process published in all photographic journals.

I may mention on this occasion that I obtained remarkable good results with a paper prepared after Mr. Hannaford's formula. The prints are only too vigorous, the half-shades are absent; when using thin negatives the prints become too weak, but I should think this process would give sufficient results when modified.

Recently I visited the *atelier* of one of our most celebrated photographers, M. Hanfstängl, in Munic. His photographic re-productions of lithographs after the original paintings of the Dresden Gallery, form a beautiful and very interesting album of 120 leaves. Among the best copies are—"The Foundling, Moses," by Paul Veronese; "Madonna," by Murillo; "Charles I.," by Vandyke; a "Dutch Inn," by Ostade; "Venus," by Guido; "Satyrs and Nymphs," by P. P. Rubens; "Potiphar's Wife," by Cignani; "The Nuptial of Cana," by Paul Veronese; "St. Sebastian," by Correggio. The copies are printed upon arrowroot paper; they have a very agreeable and rich sepia tone.

The *atelier* of M. Josef Albert, of Munic, is perhaps the greatest in Germany for re-productions of works of art. The copies of Kaulbach's cartoons are too well known, also in England, to be mentioned here. The most recently published collections are Kaulbach's "Shakspeare Album," and his "Death of Julius Cæsar."

In this year several books have been published with photographic illustrations. An edition of Schiller's Poems, and an illustrated Family Bible being the most important ones. Photographic book illustration will only come into general use when a good carbon process will be perfected. With respect to this process, I can communicate an encouraging fact.

You know M. Poitevin, of Paris, has patented for France a new process for producing carbon prints. Several persons have got licenses from him; also a painter, M. Joly Grangedor. This gentleman has now an *atelier* for copying after this process. When I visited him recently at Paris, I found several artists occupied with very large productions, and I saw a large quantity of prints which were without fault, and which could not be easily distinguished from chloride of silver prints. They were chiefly copies after plaster busts. The delicacy at half-tones was incomparable in several figures.

The microscopic photographs mounted in rings, watch-keys, scissors, and knives, come every day more into fashion in France as well as in Germany. M. Dagron, of Paris, has patented this *genré*, and has had a process with some other photographers about this subject.

At Brussels I saw some life-size photographs at Ghemar's *atelier*; the execution was not bad, only they were too much touched up.

An operator communicates me the results of some experiments about the strength of an iron developer. He used a collodion composed of—

Alcohol	1 ounce
Ether	1 „
Pyroxyline	10 grains.

Iodized with the following solution:—

Iodide of lithium	10 grains
„ cadmium	5 „
Bromide potassium...	5 „
Alcohol	1 ounce.

Nitrate bath, 1 oz. nitrate of silver to 12 oz. of water, saturated with iodide of silver.

A saturated solution of sulphate of iron had been so diluted that 1 ounce of the liquid contained 2 drams of the salt. A sensitized plate exposed twenty-five seconds to the light of a candle, and developed by that solution, gave immediately a very dense image, without the trace of a spot at the place where the developer had been poured upon the plate. Then the strength of the iron solution was so changed that the following proportions were obtained:—1·6, 1·8, 1·16, 1·32, 1·64, 1·72, 1·124. With these solutions he developed seven proofs. The results were as follows:—

No. 1.—1 drm. sulphate of iron, 6 drms. water. Density, vigorous and black.

No. 2.—1 drm. sulphate of iron, 8 drms. water. Density, good brown.

No. 3.—1 drm. sulphate of iron, 16 drms. water. Density, good, a little less vigorous.

No. 4.—1 drm. sulphate of iron, 32 drms. water. Density, feeble, bluish.

No. 5.—1 drm. sulphate of iron, 64 drms. water. Density, feeble, transparent.

No. 6.—1 drm. sulphate of iron, 72 drms. water. Density, feeble, too vitreous.

No. 7.—1 drm. sulphate of iron, 124 drms. water. Density, very feeble.

The first numbers did not show a spot; where the developer had been poured, this spot appeared the more marked, the more diluted the solution was. After the fixation the first numbers possessed a gray, dim surface, the last ones on the contrary had a fine white aspect, and became very brilliant; No. 7, showed the purest metallic lustre.

When a plate had been exposed fifteen seconds in the camera, in a glass room, one half of it was coated with the developer No. 7; after two minutes only the traces of a proof became visible; then the other half was coated with the first solution, and immediately a fine negative developed under its action. One part of acetic acid was always added to 4 parts of sulphate of iron. As the best developer for negative, the operator recommends: two ounces sulphate of iron, half an ounce of acetic acid, eight ounces distilled water.

Paul E. Liesegang.

Photographic Notes and Queries.

TONING BATH.

SIR,—Please correct a mistake you have made in the toning bath I sent you, which appeared in last week's NEWS. Read—

Chloride of gold ... ... 1½ grains
Sodæ acetate ... ... 2 drachms.

By altering this you will oblige A CURE.

Talk in the Studio.

PHOTOGRAPHY AND THE PAPAL GOVERNMENT.—The paternal Government of the Vatican has just issued two edicts of rather a peculiar description. One, which forbids tailors, tailoresses, and milliners to work on fête days, and the keepers of "ristoranti" and eating-houses to serve any food except that of the most "maigre" kind on those holy days. To appreciate the inconvenience of this despotic order, it must be remembered that for the next six months there will be on an average two of these fasts out of each week, besides the "muckle fast they ca' Sunday." The second order relates to the art of "photography," and so great are the pains to suppress this useful science, and so lengthy the clauses of the police regulations on the subject, that the "New Zealander" (supposing him to have come to Rome to try his prentice hand on the Coliseum) might well suppose it to be the "black art" itself. While the police is occupied in this moral and religious work, robbery is rampant and murder of daily occurrence. Between the 10th and 20th of last month there were seven cases of stabbing in the streets of Rome. But perhaps if the police had prevented these crimes, or traced out the authors of them, religion might in the mean time have been scandalised by a tailor gaining five paul, and therefore dining off meat on a fast day, and decency outraged by the display in a shop window of a photograph of the Venus of the Capitol, or the Apollo Belvidere.—*Daily Telegraph.*

CORONATION PHOTOGRAPHS.—The *Times* says:—Messrs. L. Haasse and Co., of Berlin, Photographers to the Court, were honoured at the time of the recent coronation of the King of Prussia, with sittings from the Imperial and Royal guests, ambassadors, and other personages of high note present at the ceremony. These coronation photographs consist of five groups, divided into nationalities, the leading representative of each nation being a distinct group of his own. Thus there is a group of his Imperial Highness the Grand Duke of Russia and ten persons, another of Lord Clarendon and nine personages, another of the Duke of Magenta and suite, &c. The series form an interesting momento of the coronation. There are two series, one on a large scale to form an album, the other in the *carte-de-visite* form. The latter, which we have seen, do great credit to Messrs. Haase and Co.

THE FATE OF HEROES.—Mr. Russell, the *Times* correspondent, says:—Captain Wilkes is, as I said he would be—and, indeed, not a shred of the prophetical mantle was needed to inspire the prediction—a hero at once, and the photographers are upon him!

To Correspondents.

F. F.—The best material for a dark tent is black "twill," lined with yellow material of the same kind. The number of thicknesses required will depend on the closeness of the texture and consequent power to keep out light. 2. An ordinary plate box will answer very well, but one of zinc would be less liable to warp from moisture. 3. The question of fixing in the field, or at home, is purely one of convenience. If you have plenty of time, and a supply of water at hand, it is as well to fix at once. If not it is best to do it at home. We shall have pleasure in answering you any further specific questions, but can scarcely enter into general advice in this column.

O. B.—The mode described in the PHOTOGRAPHIC NEWS ALMANAC, in the article on "Copying and Enlarging," is the simplest for producing transparencies. The disadvantage of printing them by super-position is that dry plates must be used, and that the negatives rapidly wear out. If you print by super-position, a few seconds exposure will be sufficient, If you use camera-printing wet collodion may be used, or dry, just as may suit your general practice. The tone of the prints will of course be much affected by the process used. Tannin plates give as rich a tone as any we know. Your rapid stereo lens will answer very well for enlarging according to the method described in the ALMANAC, and you may enlarge from 2¾ inches to 6 or 8 inches, without serious loss. We have not seen any of the transparencies you name, but think it probable, from your description, they may be produced on tannin plates. Several articles on transparencies have appeared in the present volume of the PHOTOGRAPHIC NEWS, two of which, on May 3 and 10, were by Mr. S. Fry, who has had much experience in producing transparencies.

C. P. CHAPPLE.—The rolling machine of Bury Brothers, regarding which you enquire, is, as far as we have seen, a very excellent one, and much superior for rolling photographs to a lithographic press.

OLIVER OAKWOOD.—We cannot say with certainty the cause of the stains in your print. They appear to be caused by some trace of hypo left in the paper, and decomposed by contact with an acid. The print otherwise is pretty good, but slightly bordering on hardness.

A CONSTANT READER is thanked. The matter shall receive our attention.

W. G. G.—You will find an article on "Glass Houses" on p. 73 of our third volume. We should recommend you to increase your dimensions, if you can conveniently, to at least 24 feet long, and 12 or 15 feet wide. The space without glass at the back ground end may be about 5 feet. For the rest have as much glass as you conveniently can, and shut it off by means of blinds when not required. The amount of slope or pitch is a question for the builder, but be sure you have sufficient to throw off the water rapidly, and thus keep water-tight. Regarding the best lens for carte de visite portraits, that made at the last house you mention has produced the best work we have seen.

N.—We have not seen the glass for marking seconds, which you describe. It would doubtless be useless. We are obliged by your offer to send one for our inspection, which will enable us to describe it.

H. R. NICHOLS.—We are obliged by your communication, which shall receive early attention.

J. F. WARD.—Thank you for your prompt response to our wishes. We shall make use of your letter in an early number.

TIT TAT TO.—The edition of "Hardwich's Manual" from which you quote, is probably an old one, as the matter is not so stated in the 6th edition. Not having the old edition at hand to which you refer, we cannot explain. with certainty, the passage. Where the general term "excess" of anything is used, without statement of quantities, it is manifest that the amount is unimportant, and must be left to the judgment of the manipulator. In the same way you must use your own common sense as to what the author meant by "largely." In the circumstances named, adding six ounces of water to one of the acid solution would be diluting "largely." In like manner, it is unimportant how much water you have in the iron solution, so long as you have six parts of iron to one of gold. It is by no means certain that all the trouble for purifying the gold is necessary for toning purposes. A water bath is a double vessel; the lower part of which contains water, and so renders it impossible to apply a greater heat to the upper portion than that of boiling water. In making chloride of gold for your own use, it is not necessary to crystallize it; as it is quite easy to keep in solution. You will find a very simple method of making it given on p. 86 of our third volume.

W. D. B.—We cannot refer to you any especial information on the subject of copying engravings, &c. An old and intense collodion generally gives the best results for copying engravings; but for drawings possessing colour, a good bromo-iodized collodion answers best. The kind of negatives must depend entirely upon the subject. Line engravings are well rendered by intense negatives; but mezzotints and drawings require a fair proportion of softness. We are obliged by your kind wishes.

RHO DELTA.—We do not see any especial advantages in the lenses you mention; but we have not worked with them ourselves. Thank you for seasonable compliments.

G. L.—The glass forwarded will answer for a large room admirably. It cuts off all the blue and the greater part of the green rays.

PHOTOGRAPH.—We presume of all Mr. Greenwood's agents. 2. The PHOTOGRAPHIC NEWS, which is weekly; the *British Journal* and the *Notes* are fortnightly, and the *Society's Journal* monthly. 3. We cannot say, the sizes vary; and it has never occurred to us to compare them from time to time. 4. Mr. Croger's metronome is used by photographers for counting time in relation to exposure.

THOMAS CUMBERFORD.—We are a little puzzled as to what information you require of us, as your questions and statements are somewhat oddly mixed. A plano-convex achromatic lens will answer for producing landscapes, but is not suited to portraiture. Your tube of 11 inches long must be cut to about the same length as the diameter of the lens, otherwise it would cut off part of the image and limit your field. A lens of 10 inches focus is scarcely well suited for stereoscopic pictures. If you require further information, please state your questions definitely, and each one distinctly.

J. T.—We shall have pleasure in giving you the information you ask when you call upon us. We are always at the office on a Thursday afternoon.

JOHN HAWKE.—The album portraits sent are amongst the best we have seen. The single figure of the lady is very perfect throughout, and an exquisite specimen of definition. The group is well posed, arranged, and lighted, but the lens is unequal to the work. You will of course adhere to the lens of the English maker now. The vignette is one of the most charming little things we have met with. It has but one fault, and that arises from one foot being imperfect, either from faulty definition, or an error in vignetting. The pose, lighting, and composition, are good. The tones of all are rich and pleasing. We shall have pleasure in accepting your offer of further specimens, and of hearing more about them.

THOMAS WARDELL.—It is somewhat difficult to determine the cause of the streaks you name, if, as you say, you have taken every precaution to remove the usual causes; we can only recommend a more careful performance of the same acts as a remedy. As palliative measures, take care to have the film well set before immersion of the plate; always see that all floating scum is removed from the surface of the bath; move the plate laterally a few times in the bath; and when it has been in about a minute lengthwise, lift it out and put it in again sidewise. These steps may help you. 2. The lenses about which you enquire are by the maker you name.

Several letters and articles are compelled to stand over until our next.

All Letters, Works for Review, and other Communications for the Editor, should be addressed to 32, PATERNOSTER-ROW.

THE PHOTOGRAPHIC NEWS.

Vol. V. No. 173.—*December* 27, 1861.

MY IMPRESSIONS OF PHOTOGRAPHY IN PARIS; AUTUMN, 1861.*

BY C. JABEZ HUGHES.

I have already stated my impression that English landscape photographers are more advanced than French ones. But I cannot resist the conviction that the French are superior to us in portraiture. I have been reluctant in coming to this conclusion, and have been trying to persuade myself that I am led away by the freshness and novelty of all things around me; but as I look on the collection of portraits in in the photographic exhibition, as well as those in the principal Boulevards, I feel compelled to acknowledge that those of our neighbours, compared with our own, surpass us.

Their *carte de visite* portraits possess greater softness and delicacy, are more uniformly sharp, having the head, hands, feet, and surrounding objects all equally in focus, and the figures are posed with greater ease and freedom. They also exhibit more taste and judgment in the use of accessories; the balustrade and column used more sparingly, and skilfully arranged drapery in the background is more frequently employed than among ourselves. Above all, I did not see in Paris any of those hideous abortions that, to the disgrace of all good taste, are now coming into vogue—profiled backgrounds. Painted backgrounds are not so much used there as here; and generally the getting up of their *cartes* seemed more quiet and in a better taste than ours. Consequently the figure is not lost in a mass of incongruous ornamental objects, but stands out as a portrait should do. The artists whose card pictures I most admired were Bingham, Mayer and Pierson, Ken, Pierre Petit, Pesme, Numa Blanc, Bilordeaux, and Mulnier.

Pierre Petit produces a class of pictures that is very admirable, heads about one-third life-size. They combine boldness with unusual softness and delicacy, and have none of that hard and unpleasant coarseness that ordinarily characterises the large-head photographs. They are quite untouched. Alophe, the successor of Legray, produces portraits yet more remarkable. These are heads and busts nearly life-size. They are said to be taken direct and untouched. If so, they are really wonderful, as, despite their noble size, they possess the vigour and softness of the best small pictures, and an entire absence of the repulsive grossness and distortion that usually accompany very large heads.

The pictures, however, most calculated to excite attention are those enlarged by Woodward's solar camera. Several of these are in the Exhibition, and one of the best, a head and bust of a lady, was contributed by Mayer and Pierson. This picture was sufficient to make a convert of anyone to the great merits of the instrument, for the modelling was so delicate, and the whole picture so sharp and vigorous. that I think prejudice alone could prevent any critic from acknowledging that all desirable qualities in a life-size photograph were combined in this one.

Count Aguado exhibits some of his charming pictures, enlarged by the same camera. Some rustic scenes, cattle ploughing, were uncommonly good. A portrait of himself, not quite life-size, was very soft and delicate.

Nothing shows more exactly than the solar camera the great disadvantages photographers in England labour under compared with those in France. With a clear atmosphere and almost constant sunshine, a photographer there may always use this instrument, but here its use is confined to the few summer months, when his time is entirely engrossed by his more direct occupation. If, therefore, Frenchmen beat us in the application of this instrument, some allowance must be made for the very inferior conditions under which we labour.

Though few Englishmen exhibit this year, it is pleasing to note that all that are sent are good pictures, and some of them are the best in the whole collection. What a perfect master of copying paintings is our compatriot Bingham! Whatever combination of blues, yellows, reds, or greens the artist may have used, he is sure to produce a charming copy of the painting. In his large collection of copies from celebrated pictures, there is so singular an uniformity of excellence that clearly proves that the photographic difficulties are not so great in copying from coloured surfaces as are supposed.

Vernon Heath contributes a frame of his exquisite pictures, as if to show what good landscapes should be. Mr. Russell Gordon of Chiswick, has some of the most exquisite pictures I have ever seen—views in Madeira. How is it we do not know more of this gentleman, for truly he is one of our very best photographers? While looking at his charming views I made a marginal note in my catalogue, that "they were examples of the very best English landscape photography, combining the sharpness and softness of Bedford, the delicacy of Heath, the atmosphere of Mudd, the sentiment of Robinson, and artistic feeling of Lyndon Smith," and I still feel that they merit this eulogium. I was proud to see such excellent work by a comparatively new name. I notice that this gentleman remarks that all his pictures were taken with wet collodion *heavily bromised*. Can this in any way account for the unusual softness and atmospheric feeling in these pictures? It is certainly confirmation for the advocates of bromine in collodion.

Mr. Annan of Glasgow exhibits three very nice Scotch scenes. It was very pleasant to stand in the *Champs Elysées*, to admire "the country of Rob Roy," the banks of Loch Lomond, and the old Clachan of Aberfoyl.

I looked in vain for art-photographs, in the sense that Rejlander and Robinson execute them. Neither in the shops nor the Exhibition did I see any. Can it be that this land of fogs is more favourable for the development of the poetic feeling? The most sentimental French landscape photographer, Silvy, has come to reside with us. Maxwell Lyte, who exhibits the finest French landscapes, is an Englishman; and Bingham, the man, *par excellence*, to translate French works of art into photography, is a Londoner. If, therefore, in the amicable contest of next year, when in the International Exhibition the best works of the best artists are seen side by side, if there our French brethren overpower us in one direction, I think we shall win laurels in another. If we cannot compete in the life-sized portraits produced by solar camera of Count Aguado, Mayer and Pierson, and Disderi—if the more directly taken portraits of Alophe, Petit, and Ken, are larger and more delicate than ours—if Bisson *frères* and Baldus show monuments and landscapes of larger surface—if even the *cartes* display more taste and finish (and on all these points, I, as an Englishman, hope my impressions are incorrect), we shall yet be able to point to our numerous landscape artists, as being far in advance of our French *confrères*. Beginning with Bedford, and ending with Wilson, the last and greatest of all, we shall show that we are years before them in capacity to do justice to the external charms of nature.

We shall also be able to show our successful efforts to get photography recognised as a Fine Art, allowing the works

* Continued from page 602.

of Robinson and Rejlander to prove that the camera is a perfectly legitimate vehicle of artistic expression.

With the capacity, therefore, to establish these points, we can willingly cede others, knowing that nothing so gracefully accompanies the capacity to teach as the willingness to learn.

I conclude my desultory impressions, then, with the hope, that when French and English photographers meet, they will manifest a disposition to do full justice to their several works, for on a fair comparison, I am convinced they have much to teach and much to learn from each other.

OPERATORS AND PROCESSES IN AMERICA.

Mr. Seeley, Editor of the *American Journal of Photography*, has not a very high opinion of American operators. Writing to our contemporary, the *British Journal*, he says—

"I have called upon some of our prominent photographers for preciso information as to their present methods of working. I have no difficulty in procuring the information desired, but I am somewhat restricted in the communication of it to the public:—1st. I am desired to omit any mention of names. Our photographers, like artisans generally, desire their neighbours and rivals to believe that there are profound mysteries: very few are willing to confess that they are no better off than others. Every ignorant man has his tremendous secret: it is only the most intelligent who have any modesty and feel that there is a narrow limit to their knowledge. I know no animal more piggishly obstinate and self-contented than your "artist" who throw away his lapstone only last week to become a photographer."

We hope Mr. Seeley's opinion of American photographers is to be understood in a "Pickwickian" sense, otherwise there could not be much reliance on the statement of their formulæ which he subjoins. We have reason to believe, however, from other sources of information, that he is correct. He says:—

"A large majority of our photographers manufacture their own collodion. The reason probably is in the fact that the ingredients of collodion are every where cheap and accessible. Alcohol, suitable for collodion of 95 per cent., is sold for fifty cents to one dollar per gallon, and ether for twenty-five to fifty cents per pound. The most ordinary proportions for ether and alcohol for collodion is equal parts. There are those who prefer an excess of one over the other, but tho old dictum of "five to three" is wholly abandoned. Every one here here uses a bromide in the collodion. In the early days of photography bromide of potassium was universally employed; now no one thinks of it, and only for the reason that it requires too much water to be introduced into the collodion in order to dissolve it. For a few years iodide and bromide of magnesium were great favourites, chiefly on account of their recommendation by one of our then high authorities, Mr. Moulton.

"For developer, the sulphate of iron is in universal use. Pyrogallic acid was laid on the shelf six years ago.

"The independent gold toning is adopted by all those who use albumenized paper.

"I present the following formulæ as the most relied upon:—

Collodion.

Ether	5 ounces
Alcohol	5 „
Gun-cotton	50 to 80 grains
Iodide of ammonium	50 „
Bromide of do.	20 „
Or with the above plain collodion—	
Iodide of potassium	2½ „
Do. of cadmium	4 „
Bromide of do.	2 „
Or,	
Iodido of potassium	5 „
Bromide of cadmium	2 „

"The silver bath—40 to 50 grains of nitrate of silver to the unce of water.

Developer.

Water	20 ounces
Sulphate of iron	2 „
Acetic acid	3 „
Alcohol	2 „

"In the remainder of the process thero is nothing worth mentioning, unless that the impression sems to be extending that it is unnecessary in printing to use over fifty grains of nitrate of silver to the ounce of water, for albumenized paper.

"As a strengthener for negatives sulphide of potassium may be found in every gallery."

EXCHANGES OF PHOTOGRAPHS.

BY COLEMAN SELLERS.

[It will interest many of our readers to learn from the following communications published in the *American Journal of Photography* that the system of exchanging photographs is beginning to be established amongst the photographers of the United States, although they do not seem as yet to have organized any regular club for the purpose. Members of the Photographic Exchange Club may derive some suggestions from the paper of Mr. Sellers.]

One of the greatest pleasures to be derived from the practice of amateur photography is in systematic exchanges. There are always plenty of friends ready to have us give them pictures which they innocently think cost us nothing. It is a pleasure so to give too; but a greater pleasure to enclose some pretty proofs to a photographic friend who will look at them with artist's eye, criticise their faults and praise their merits, and it is a pleasure too to tell him how they were done—under what circumstances of light, what make instrument, and so forth—and then in due course of time comes to us some return print from our friend, with some word of advice, and sometimes thanks for advice given.

Now, for my part, I do not like to mount my own prints, but I do enjoy mounting those sent to me; and it is with eagerness they are, when mounted, put into the instrument when passed, still wet with paste, around the home circle, and, while another is being mounted, listening to the exclamations of pleasure from wife, children, and friends. Stereographs too, are so easily sent by mail, unmounted, but they need some writing to explain each, hence comes the necessity of a printed label, which can be stuck on the back of the card and tell the story of the picture. That story is in two chapters, it must say what the picture represents as to locality, and so forth, and it should tell how it was made. This necessity has suggested to me a form of label which seems to work well in practice, and I here give it for the benefit of all interested—

MEMOIR.
JAMIN TUBES.
ARRANGEMENT.
OPENING.
COLLODION.
EXPOSURE.

No. Photographed by
COLEMAN SELLERS.

The blank space to the right explains itself as does also the memoir; but a word or two obout the memoir—this something to be remembered—it can be filled in:—*portrait* arrangement, *full* opening, *wet* collodion, *thirty seconds* exposure, *side light*, *dull day*, *strength with bichloride of mercury*.

Now I would earnestly recommend all who wish to exchange prints to have labels printed on some such plan as this—some way of telling how the negatives were made, and, better still, if some words were added as to how toned and fixed. It would be well too for those who can do so, and who have more time to be orderly than the writer has, to prepare a book; at the head of each page paste half a stereograph print, below it the memoir and number; and then as prints are sent away to those who will exchange, enter the name and date of each to whom a copy has been sent with memorandum as to tone and quality. This is the plan I propose to follow when, as I always say, I can get time to be neat.

THE PRINCIPLE OF THE DIORAMA APPLIED TO PHOTOGRAPHIC PICTURES.

(From the *Glasgow Daily Herald*.)

Within the last day or two we have had the pleasure of inspecting a highly interesting invention of our townsman Dr. Taylor, of the Andersonian University, by means of which the principle of the diorama has been applied for the first time to photographic pictures. Photography produces pictures admirably perfect in the form and proportions of their objects, and unapproachable in truthful accuracy by any other species of art. To give the charm of colour, and of changing light and shade, with the varied hues of morning, noonday, evening, or moonlight, along with the fidelity of the photograph, seemed to be all that was requisite in order greatly to increase the gratification derivable from the inspection of such pictures. The translucency of photographs on glass fits them in a greater degree than any other species of picture for taking on in a truthful manner changes of hue and shade by transmitted light; even the deepest shadows, from their semi-transparency, being capable of being affected in their hue by the general change of colour of the light. Dr. Taylor's principle and its application possess the merit of extreme simplicity; and, considering the sudden and rapid development of photographic art, it is somewhat astonishing that nobody had previously alighted upon this secret. The Doctor's problem was not merely to colour the photographic plate—not merely to produce successive transitions of colouring before the eye of the spectator, but to produce even the movement of clouds. This, we can say from what we have witnessed, has been successfully accomplished. The apparatus consists of an ordinary cosmoramic box, with a slide in the one side of it, for holding the picture, and with lenses on the opposite side, properly placed, through which the spectator looks at the picture. The pictures are carefully dimmed, or rendered slightly opaque in the light, to prevent the motion and forms of objects behind them from being too distinctly seen through them, and a little delicate and appropriate colour is painted on the opposite side of the glass. The chief modification and change of colour and shade are produced by the motion of a coloured surface placed behind the picture, and strongly illuminated by a row of gas burners, the light from which is kept from directly reaching the picture. This surface, on which the clouds and bands of graduated colour and shade are painted, is stretched round a light frame of wood, so as to give it a cylindrical or drum shape. The drum is about five feet in diameter, and is suspended by a cord from the roof. It is kept by the hand, or by means of some appropriate machinery, in a state of slow rotation, so as to bring the differently coloured and shaded portions successively opposite the pictures. The drum is placed at a distance of about nine inches from the picture; and the differences of distance between the lens and the drum contribute much to the beauty of the aërial effects. By this simple appliance, wonderful results are produced. Whatever perspective exists in a picture is brought out in a manner that the ordinary methods of painting need scarcely hope to equal, and every object bulks out from the picture with such completeness that one feels he could take a hold of it. It is scarcely to be doubted that this simple appliance, which could be easily fitted up, so as to be both portable and elegant, will yet be so mechanised, or arranged, as to become an agreeable means of enjoyment in many private families. It is right to say that Dr. Taylor has been ably and indefatigably seconded in his labours by Mr. Macnab, photographer, West Nile Street, who printed and prepared some of the plates, and in whose premises we had the pleasure of inspecting the apparatus. The actual measurement of some of the plates which we saw was 15 inches by 12; the magnified size, as viewed through the lens, was of course much greater.

Dr. Taylor suggests that the same mode of viewing stereoscopic pictures in glass, by means of a moving coloured background, might be followed, as it adds greatly to their effect. In this case a flat disc, turning on its centre, and laid flat on a table, seems to be the best form for use. The usual obscure glass used to cover the stereoscopic picture must be removed, and a transparent glass slightly dimmed, put in its place. Much of the beauty of the effect depends, as a matter of course, on the manner in which the bands of colour and shade are arranged on the disc.

Proceedings of Societies.

North London Photographic Society.

The usual monthly meeting of this Society was held on the evening of Wednesday, December 18th, in Myddelton Hall, Islington, G. Shadbolt Esq., in the chair.

The minutes of a preceding meeting having been read, Messrs. Noble and Francis were duly elected members of the Society.

The Secretary then read a paper on "the Original Fothergill Process," by Mr. Samuel Bourne, of Nottingham, in which the process, as originally published, was maintained to give results equal in excellence, and surpassing in certainty, most of the modifications and discoveries which have been promulgated since. The paper will apper in our next. Several large pictures, remarkably free from faults of manipulation, were contributed to the Society's portfolio by Mr. Bourne, as specimens of the process.

Mr. Hill observed, regarding the collodion most suitable for the Fothergill process, that he always found that sold for positives, namely, a thin bromo-iodized collodion, gave the best results.

The Secretary confirmed this remark, and referred to Perry's as a favourable example of the proper quality.

The Chairman observed that Mr. Hardwich had always recommended a thin collodion both for wet and dry processes.

Mr. Shave remarked that an especial advantage of such a collodion for dry plates was the fact that it developed so much better.

The Chairman thought that Mr. Bourne was in error in saying that no four drachm washing—by which he meant the limited washing, consisting of four drachms of water for stereoscopic plates, recommended by Mr. Keene—would allow plates to be kept a month. He (the Chairman) had, as he had before stated in that room, kept plates so washed for ten months and had still got clean pictures. These plates were 9½ by 7½ in. and were only washed in 4 drachms of water for that large size. He did not think keeping qualities depended upon the amount of water.

Mr. Hill thought that the chief thing insisted upon by Mr. Bourne was that a larger per centage of successful plates resulted from thorough washing,

The Secretary remarked that the observations on keeping referred to summer weather.

The Chairman said it was quite a mistake in reference to any weather. The plates he had referred to were kept from the 19th of June one year, to the May of the following year.

Mr. Shave thought that keeping qualities depended more upon the last washing water than the first.

Mr. G. Wharton Simpson observed that Mr. Bourne used a chloride in his albumen solution, which would tend more effectually to remove free nitrate of silver from the plates than a very copious washing.

The Chairman remarked that he attached great importance to a thorough final washing, and the application of a forcible stream to remove the albumen. In his own practice he used a flexible tube with a glass tap; the cistern containing the water was fifteen feet above, thus giving considerable force to the fall of water. The use of a tube in this way allowed the stream to be walked, if he might use the phrase, all over the plate.

Mr. Shave referred to the importance of covering the plate with an even wave of albumen. It was difficult to get the streams of albumen to join without causing a mark, if it were not poured in one even continuous wave at first.

Mr. Hill found great difference in samples of collodion for allowing the albumen to flow easily.

The Chairman said amongst the modifications of the

Fothergill process, that of Mr. Hannaford, or rather Mr. Barber's improvement upon Mr. Hannaford's method was worthy of attention.

Mr. Simpson said if he remembered correctly Mr. Barber proposed to add oxide of silver direct to the albumen solution, instead of forming it in the solution by means of nitrate of silver and ammonia.

After a conversation on the strength desirable for the albumen solution, in which it was agreed that the strength was comparatively immaterial, and a conversation on the specimens in which it was agreed that a slight amount of monotony, or absence of brilliancy, was due evidently to the lighting, and did not detract from the merits of the process, and the excellency of the manipulations, the subject dropped.

Mr. Hislop then expressed a wish to make a few observations regarding the discussion on his paper at a previous meeting, which he was unable to attend. In the first place, regarding the preliminary coating of albumen on his plates. Some gentlemen seemed to think that it would act upon his bath and discolour it. The argument might be strong and reasonable, but so far as his own experiments went, they tended to prove that no such action took place. His bath was prepared two years ago, and had had no doctoring of any kind since, except the addition of silver to keep up the strength, and sometimes the addition of acetic acid. In this bath some hundreds of plates had been excited, and fully nineteen-twentieths of these had been excited since it was his custom to coat with albumen, which he used, even for plates by the wet process, as he prepreferred to avoid the slightest risk of losing a good negative through the film leaving the glass. He had decanted a few ounces of his bath and brought in the bottle, which he now exhibited, and from which it would be seen the solution was perfectly bright and free from discolouration. As far as his own experience went, then, the use of the albumen did not spoil the bath. The next question was its effect on the picture. Some gentlemen seemed to think that much of the quality of the picture would be due to the presence of albumen, and some had even gone so far as to say that the collodion film might be removed and the picture left upon the albumen. He must confess he did not see how that was possible. As, however, he conceived experiment was better in such cases than either assertion or argument, he had prepared two plates, both with Ponting's collodion. One was upon albumenized glass, in his usual way, the other upon unprepared glass; they were both simply washed and dried as he had described in his paper. The pictures produced upon these plates he would now submit to the meeting, and ask the members to point out, if they could, which was on the albumenized plate, and which was on the unprepared glass. He was not prepared to assert that albumen was the best material wherewith to coat the glasses, but he had found no inconvenience from it. He believed its use was purely mechanical, and that it did not contribute in any way to the production of the picture. He was glad to see that Mr. Glover had recently suggested the trial of india-rubber for that purpose. For his own part he had met with a much larger measure of success, and obtained more good pictures, since he had used the preliminary coating than he had ever done before.

The Chairman thought Mr. Hislop was in error in one part of his remarks. No one had said anything about the effect of the albumen coating on the bath. He had himself said that the film of albumen itself would be acted on by the bath, through the coating of collodion, there was no doubt about that. The fact had been observed by numerous operators. Mr. Barnes, who was one of the first experimentalists in that direction, had found the picture so produced, to be on the substratum of albumen; and he (the Chairman) had himself actually removed the collodion and left the picture behind. In the picture shown, without a previous preparation of albumen, Mr. Hislop's position was much better illustrated.

Mr. Evershed asked if Mr. Hislop found the film of the finished picture harder for the previous coating of albumen.

Mr. Hislop had not noticed any difference in that respect.

Mr. Hughes said he had had some experience in working with plates which had received a preliminary coating of albumen. He used them for producing negatives by the wet process, and developing with iron. He could not say whether the same results would follow in dry plates, but it might be important to state briefly his own experience in the matter. He tried some years ago, when it was first proposed by the Rev. Mr. Laws; the object he aimed at was a sufficient amount of intensity by means of iron development without further intensifying, and it answered the purpose admirably, giving, with the ordinary bath, slightly acid, very fine negatives. Everything went all right until a few plates had been excited in the bath, and then the pictures began to be gradually covered with a foggy reduction, this continuing until they were hopelessly fogged in a very short time. He was compelled from this cause only, to give up the process, and at that time with great regret, as with a bromo-iodized collodion, and iron development it gave rich negatives combining the utmost sensitiveness, delicacy and vigour. He never observed that it discoloured the bath, but it unquestionably produced the results he had described. He had some of the negatives now, and had recently shown them to Mr. Simpson as specimens of the finest class of negatives, but for that unfortunate tendency.

Mr. Hislop could only say, that in his hands it had never produced those evils. He used the same bath and the same plates in photographing philosophical diagrams, which required the utmost clearness, some parts being bare glass.

Mr. Bingham asked if Mr. Hughes was careful to have his coating thoroughly dry?

Mr. Hughes said he was always careful to have the completest state of dessication.

Mr. Hislop said, possibly the very dilute character of the albumen solution might affect the question.

Mr. Hughes said very probably, indeed. He had used pure albumen.

The Chairman said, referring to the specimens, he could easily determine which had been produced on the albumen coated plate, as it was decidedly more vigorous than the other.

After some further consideration on the subject, in which Messrs. Simpson, Hughes, Hislop, and the Chairman took part,

Mr. Hughes remarked that Mr. Laws especially claimed for the preliminary albumen coating, that it gave increased sensitiveness.

Mr. Hislop found it gave decidedly more sensitiveness. On a ground glass, especially, he found longer exposure was necessary.

Mr. Evershed referred to a method recommended some time ago in the French journals, of rubbing a little pure albumen over the plate with a piece of cotton wool.

The Chairman thought that was a clumsy inefficient method of doing what Mr. Hislop did so easily, namely applying a very thin film of albumen to the glass.

Mr. Simpson asked Mr. Hislop for the precise details of his albumen preparation.

Mr. Hislop added one egg to eight ounces of water, and about half a drachm of glacial acetic acid to three ounces of this preparation. He floated it on to the plate like collodion.

Mr. S. Fry asked if Mr. Hislop had tried the effect of an edging of varnish round the plate?

Mr. Hislop had not found it sufficient to prevent films leaving the glass.

Mr. Fry had found it a perfect cure.

Mr. Hill then exhibited some stereograms, and the Chairman showed some specimens taken on slightly albumenized paper and waxed, to give them the finish of highly albumenized samples.

After the usual votes of thanks the proceedings terminated.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 24th December, 1861.

M. Faye, the astronomer, recently presented to the Academy of Sciences, a photograph representing a complete observation, obtained automatically, of the passage of the sun across the meridian. In displaying this first attempt at a new application of photography, M. Faye remarked that he had no hesitation in expressing his belief that the great future of photography lies in this direction. M. Le Verrier has renewed his promise to take into consideration the means presented by photography, so effectual and prompt, of obtaining delicate results, free from systematic and personal errors. The apparatus employed by M. Faye was constructed by M. Porro, and is so simple, and so nearly automatic, as to require only the superintendence of an ordinary workman.

Photography has also been made to lend new aid to the healing art. M. Czermack has availed himself of its resources, by applying it to laryngoscopy. He announces that he has completely succeeded in taking both single and stereoscopic pictures of the nasal and laryngical regions, illuminated by the mirrors of the laryngoscope. These photographs have been examined by the eminent anatomist, M. Flourens. To fix and exhibit in relief such organic cavities, which hitherto have scarcely been seen at all, is unquestionably a step in advance, for which surgery is deeply indebted to photography.

M. Migurski, of Odessa, has presented to our Photographic Society a set of proofs, obtained by the following method:—When he employs Woodward's Solar Camera, he uses a strongly sized paper. The silver bath is of the strength of 10 per cent., with the addition of 8 per cent. of crystallizable acetic acid, and 1 per cent. of carbonate of soda. The development is made with a saturated solution of gallic acid, to which is added ½ per cent. of citric acid. The exposure is very brief, from 2 to 5 seconds with a convergent lens of 12 inches in diameter. The proofs are well washed in the dark room before fixing, and toned with chloride of gold and sodium.

In another method, he employs an enlarging instrument, with parallel rays of light, and of 5 inches diameter. A negative obtained in the usual manner, upon a third or quarter plate, with an instrument of 3½ inches in diameter. When dry, it is copied in a frame upon a dry albumen plate. This copy must be very vigorous. The negative thus obtained may be enlarged to any desired dimensions. Generally a third or half the size of nature is preferable, upon a collodioned plate of 20 by 16 inches. For large negatives waxed paper is preferable. Develop with sulphate of iron, and strengthen with pyrogallic acid, to which ½ per cent. of citric acid is added. The exposure is often instantaneous, never longer than five seconds under favourable circumstances. An enlarged negative will serve for the reproduction of proofs by any of the methods generally in use.

It may justly be considered that the problem of the application of photography to topography has been solved by M. Chevalier in his invention of the *Photographic Plane Table*. This instrument gives at one and the same time, the station, point, and the azimuths of the various levels, so that the image serves immediately for the construction of a plan, without any geometrical construction whatever being required. I shall reserve the details of the operations of this instrument to another occasion.

You will, doubtless, remember, that a short time ago the Abbé Laborde published a communication on the employment of free iodine in the nitrate negative bath. He therein stated a fact quite at variance with chemical theories, viz., that the bath to which the iodine is added does not acquire acidity. This statement caused the greatest surprise among chemists, for it seemed incomprehensible that the iodine, in displacing silver, should not set some nitric acid free. M. Girard undertook to verify this statement, who finds the clue to the very natural error into which the learned Abbé has fallen in an interesting communication made by M. Adolphe Martin to the Paris Photographical Society. This chemist shows that most of the iodides of commerce, that of cadmium among others, contains a notable quantity of oxide, which can only be separated by dissolving the iodide in absolute alcohol. From this it appears probable that, by the employment of the impure iodides of commerce in collodion, the Abbé Laborde had dissolved in the nitrate bath not only some iodide, but also some oxide of silver, the quantity of which may be, perhaps, much more considerable when iodide of ammonium is taken, which produces in the silver bath some nitrate of ammonium, the dissolving properties of which, in relation to oxide of silver, are well known. Thus it happens that in subsequently adding free iodine to such a bath, the latter will carry its action, not upon the nitrate, but upon the free oxide, so that there will be formed, at the expense of this base, some iodide of silver, and this is ameliorated in becoming really more neutral without acidity manifesting itself. But when M. Gerard to a nitrate bath of the strength of 7 per cent. saturated with pure iodide of silver, prepared by means of iodide of cadmium, purified in absolute alcohol, it was sufficient to add to this bath a very feeble trace of free iodine for it to become immediately acid to test-paper.

M. Anthony Thoret communicates the result of his attempts to act upon the Abbé Laborde's recommendation as follows:—he added 6 grammes of iodine to 200 c. c. of nitrate bath. Two hours afterwards the iodine was covered with iodide of silver. Blue litmus paper immersed in the bath turned red instantly, as if by the action of a strong acid. Thinking that the bath might not have been completely saturated with iodine, another, 100 c. c. well saturated, was taken, and 3 grammes of iodine added, but with the same result. Lastly, he took a third bath, with the excess of iodide left in suspension: the same result attended the addition of the iodine.

In the presence of so large a quantity of free acid it was useless to try a plate, but the whole of the quantity experimented upon were mixed together, and the nitric acid saturated with oxide of silver formed in the bath itself by the addition to it of lime water. It appeared to result, that in the course of two hours, of the 12 grammes of iodine added, 89 centigrammes were combined with 77 centigrammes of silver to form 1·66 grammes of iodide, by liberating 39 centigrammes of nitric acid saturated subsequently by 2 decigrammes of lime. If the reaction had continued with the same energy for 27 hours, all the iodine would have become transformed into iodide.

ON MOUNTING PHOTOGRAPHS.

Sir,—This necessary operation having long been a source of annoyance and trouble to me, I was glad to see the topic discussed in so useful a manner at the meeting of the South London Society, reported in the News of November 22nd. One important point was apparently unnoticed, viz., the quality of the cardboard mount with respect to its power of resisting cockling. I have found that different makes of cardboard possess very marked differences when treated in precisely the same way. One batch of stereo mounts procured by me last summer is so bad, that I find it impossible to mount prints on them (even when dried under slight pressure), without finding the mount warped to some extent at the end of the process; and as this fault does not occur with mounts procured from another source, I feel justified in blaming the cardboard, and think that the subject is worthy of the consideration of amateurs, and the dealers who supply them with photographic desiderata.

I may add that I invariably use fresh starch, mixed as thick as will admit of its being spread with a stiff brush.

I am, sir, yours very truly,
Rho Delta.

Sir,—The discussion reported in a recent number of the Photographic News, on the subject of mounting photographic prints, is one of great importance to every artist and amateur of the art, and too much attention cannot be called to the subject. I have frequently seen the appearance of the finest prints, as such, completely spoiled by bad mounting, even in some of our crack exhibitions. It may be, as yet, a moot-point as to what adhesive substance is the best for the purpose; it is not, however, I am convinced, on the other hand, difficult to name from actual experience several that should be avoided. Gum, for instance, gelatine, common paste, or starch, are never used, I believe, by professional mounters, who, I daresay, have good reason for eschewing them; and amateurs would do well to follow

their example. The substances most frequently used, are, I am informed by one of our principal photographic mounters, dextrine and glue, according to the size of the photograph, and the kind of paper or cardboard on which the print is mounted. Indeed, the only difficulty in the whole matter, as far as the mounting is concerned, rests with the mount itself. I have always found a difficulty in this respect myself, except when I have used very thick five or six-sheet cardboard, by which the cost of the mounting is greatly increased, and the artistic effect, as compared with "plate" paper, considerably decreased. I have lately had a number of large views mounted by a firm in Paternoster Row, in a very excellent manner, for the Exhibition of 1862 on a paper similar to that used for printing first class engravings on, and with a tint, in imitation of india paper, like that referred to in the Photographic News. There is no appearance of "cockling," and the prints are very highly glazed. I understand that the adhesive substance used in this case is some kind of dextrine, specially prepared for photographic mounting. If you will allow me, I will just hint that the gentlemen named would confer a great boon on photographers in general, and especially on those resident in the country, if they would explain their method of manipulation, or, at all events, bring the substance they use into the market commercially. As far as my prints are concerned, I have no hesitation in saying that the mode in which they have been treated far exceeds my expectation. They are "thrown up," as it were, in a wonderful manner; a result I attribute to the substance with which they have been mounted. You will excuse a photographer's fondness for the offspring of his labours, and pardon my going so fully into the subject. I do not write to you with a view to puffing any particular house, but simply to record my experience, for the benefit of others, as one of the earliest amateur photographers, on a matter of such great importance, feeling convinced as I do, that no picture can look its best unless it is well mounted. I need say nothing of *squaring*; the artistic eye can scarcely be more offended than by a picture cut or mounted *on the squint*; nor on the subject of *margin*—that is a question of taste, which experience will soon reduce to a rule. The French are very particular, and very successful, in both these respects, as will probably be seen at Kensington next year. I hope that some, at least, of their *confrères* in the domain of art will not be behind them in this apparently trifling, yet really very important, point.—I am sir, yours respectfully,
Cupar Robertson.

Blackheath, 10th December, 1861.

SIZE *versus* QUALITY.

Sir,—On behalf of my professional brethren and myself, I deem it right to offer a few words on the article in a recent News, "Photography and its Students," by Mr. Samuel Fry.

It cannot be denied that there *is something wanting* amongst the amateur and professional photographers of Great Britain as to the production of large-sized pictures, but in the majority of cases, it will be found that much as amateurs admire and desire to produce large pictures, they have in very many cases, neither the money to expend in the necessary purchase of apparatus, or the time to give to their production, even if they had it. Some few that I know have the means of producing pictures up to 22 by 17. But the majority inform me that "it's all very well now and then to take these pictures, but it's a great bore." With professionals, on the other hand, it is something similar. We as a nation are not fond of change, and we prefer sticking to what is really good rather than attempting what a "discriminating public" would unhesitatingly consider *bad*.

On the Continent and in America, it must be borne in mind that wages and materials, rent, food, &c., are considerably cheaper than with us, and in some countries government lends its aid to the photographer.

With the bulk of our professionals, both in town and country, the pourtraying of the human face divine is more lucrative than all the large landscapes and buildings would be, and we very naturally keep to that which enables us to live; and I think it will be found that the proportion of professional photographers in landscape and portraiture (as far as England is concerned) is as one to five. Of dry plate photography I know but little—enough for my own purposes—as in its present stage very little reliance can be placed on any one particular process. I say, nothing like "wet collodion" for certainty. At the same time I would, in common with my professional brother, Mr. Samuel Fry, urge on all intending exhibitors to strain their utmost to produce works (whether they be great or small) worthy of Great Britain and its amateur and professional photographers.—I am, sir, yours &c.,
W. H. Warner.

Ross.

PERMANENT PRINTS, FIXING BEFORE TONING.

Sir,—In the News of the 6th inst., I see there is reference made, by a correspondent, to a French process of "fixing before toning," and also a note by yourself to the effect that the process is both "tedious and unsatisfactory" so far as albumenized paper is concerned. But as you spoke rather from uncertain data, I thought that a few observations from one who has had considerable experience in the process might be of some service to your readers. One thing I am quite certain of, that you can invariably get pure whites, transparent shadows of a fine rich brown, or a deep purple tone, without fear of failure. And that the prints are more permanent than those toned by any other processes that I have tried. Enclosed is a print on albumenized paper, done three years ago, and it has lost none of its brilliancy, and that is more than I can say of some of my prints toned by the alkaline toning processes. You must not suppose that it is through the varnish on the print that it retains its brilliancy, as a spoiled print (spoiled through uneven pressure) done at the same time will speak the contrary. If you think the process of any service, I shall be happy to communicate the same to your readers.—Yours respectfully,
Thos. Tedrake.

Appledore, Devon, Dec. 17th. 1861.

[We shall have pleasure in receiving details of our correspondent's experience in this matter.—Ed.]

PHOTOGRAPHIC CARICATURES AT ROME.

(From *Punch*.)

In a letter from Rome it is stated that—

"The official journal of yesterday contains an edict from the Cardinal Vicar announcing that no one will be allowed to exercise the art of photography without authorization from the Rev. Master of the Sacred Palace, from the Cardinal Vicar, and from the police, under penalty of 50 dollars fine. Amateur photographers are liable to the same regulation."

A maternal government imposes this restriction on the personal liberty of its subjects, because some of them abuse the photographic art. Provision for the punishment of offenders in that kind, one would think, would suffice to meet the case; and their correction has been tolerably well provided for by the arrangements thus specified:—

"The producers and distributors of indecent photographic plates are to lose their instruments, to be fined 100 dollars, and to be sent to the galleys for a year; the same penalty to be inflicted on the models who may have served for such productions."

Serve them right. But what cause has the Roman public to thank the papal Government for giving it the benefit of an improvement on Lord Campbell's Act? We further read that—

"It is stated that this edict . . . was absolutely called for by the recent clandestine publication of some very scandalous photographic representations in which the heads of the Pope, Cardinal Antonelli, the Queen of Naples, and other persons of high rank, were placed on the bodies of other individuals in such a skilful manner as to deceive any spectator, and with such a disregard, not only to delicacy, but also to decency, as fully justifies the measures adopted by the Cardinal Vicar."

Would his Eminence have interfered with the licentious photographers if they had placed the heads of Garibaldi, Victor-Emanuel, the Emperor of the French, Lord Palmerston, John Bull, and *Mr. Punch*, in the same vile relations as those in which they put the upper storeys of Antonelli, the Queen of Naples, and his Holiness, or in any relations however vile? And if the head of the Pope were put on the body of a figure in pontificals blessing a Neapolitan brigand, that of the Queen of Naples on the shoulders of *Moll Flagon*, and Antonelli's on those of *Fra Diavolo*, would not the Cardinal Vicar consider the photographs so composed as exhibiting a grievous disregard to decency as well as delicacy? It is no doubt sacrilege as well as high treason at Rome anyhow to take off the head of the Church. What a wonder the Sun lends himself to such an enormity! Cannot Pius excommunicate Phœbus?

Miscellaneous.

Photographic Aids to Physiognomy.—It is equally true that with such portraits and engravings of portraits as we have had, it has been utterly impossible to get beyond the nebulous science of a Lavater. We required the photograph. Certainly it looks a hard thing to say that the great portrait-painters are not to be trusted. Is it to be supposed that these masters did not know their business, and have failed to give us correct likenesses of the persons who sat to them? It must be remembered that to give a general likeness is one of the easiest strokes of art. With half-a-dozen lines the image is complete, as anyone may see in the million wood-engravings of the day; while, at the same time it would be difficult to gather from these rough sketches, where two dots go for the eyes and a scratch for the mouth, what is the precise anatomy of any one feature. So, while we can accept as in the main truthful, the portraits that have come down to us, it is impossible to place perfect reliance on any particular lineament. Take the upper lip, for example. This is perhaps the feature of the face which not only the portrait-painters, but likewise all the copiers of the human form, have most trifled with. We can often accept the lower lip that they give, but the upper is a myth. Then of this upper lip, we can sometimes rest content with the corners, the artist looking chiefly to these for the expression, but of the middle part we can never be certain, except in the knowledge that nineteen times out of twenty it is false. There is a form of this part somewhat like a Cupid's bow, which is considered the most beautiful, and which the painters are always repeating. The centre of its upper line comes down to a sharp point, and the centre of its under lines falls into a point rather less sharp, and forming a little ball or drop that sometimes delicately clasps the lower lip, sometimes (especially in Raffaelle's heads) hangs loose above it, and parted from it. From these two points the lines sweep away on either side in two pairs of ogee curves, which are now and then caricatured (very frequently by Vandyke) in the undulations of the moustache above. Such is Raffaelle's favourite lip: he hardly ever has a face without it. One would fancy that all the people of Vandyke's acquaintance had it. Kneller is great in it; so is Fuseli. Sir Thomas Lawrence gives it with a vengeance to all his sitters—curling the curves, and making the little drop in the centre almost drip. The painters are never satisfied without it, and give it to all their heads alike—to Cortes as well as to Cervantes, to Descartes as well as to Shakespeare, to Arkwright not less than to Schiller and Goethe. What the painters do badly, the engravers do worse; and so this lovely lip is rendered vulgar and meaningless. Belonging to a few, and that few a defined class, it is represented as the common property of all. Nothing short of the photograph can correct this uncertainty, and make the physiognomist feel that he is on sure ground. The photographs produced by such men as Mayall, Dickenson, Silvy, and Watkin leave little to be desired. Nothing more truthful, and nothing cheaper. A collection of good portraits is now within everybody's means; and everybody is making a collection. Let us hope that something will one day come of these numerous collections.—*Cornhill Magazine.*

Photography on Phosphorus.—Dr. Draper has just made known a curious photographic action which light possesses upon phosphorus. He found that ordinary yellow phosphorus on exposure to light became converted into the allotropic red modification of that element. He, therefore, formed some into a thin sheet by melting it between two plates of glass. On this surface he succeeded in photographing the fixed lines of the spectrum and in taking on it prints from negatives. Some of the prints have been preserved in the dark for five or six years. As the yellow modification of phosphorus is readily soluble in several media, whilst the red variety is almost insoluble, these prints could be readily fixed by pouring ether or bisulphide of carbon over them; the unimpressed parts would thus be readily dissolved away. On account of the great inflammability of phosphorus these pictures can only be looked upon as chemical curiosities; they are, notwithstanding, of great interest.

A Cheap Prism.—A correspondent of the *Scientific American* says:—Having read an interesting account of the spectroscope, I set my wits to work to construct one for my own amusement; not having the chandelier ornaments or any solid pieces of glass to construct the prisms of, I took a very clear thin pane of window glass, cut out two pieces to suit my taste, cut a thin back and bottom for the third side, fastened with thin strips and set the glass with putty, making a very thin prism with open top in which to turn some clean water when I wished to use it. The prism would have to sit on its end, instead of lying longitudinally, which I suppose makes no difference in the reflection. I think it has some advantages over the solid prisms. Defects in the material used do not show so plainly, the cost is slight even for a large one, and they might be constructed tight like a spirit level, and used in any position. Most people have skill enough and material handy for the construction. [If the correspondent will fill his prism with the bisulphide of carbon he will have the prism used by Bunsen and Kirchoff in their apparatus. Water, however, makes a good prism.—Ed.]

Talk in the Studio.

Booking a Customer.—Messrs. Cutts and Longstick, who have suffered much from the difficulty attending the identification of "clients" on their return from a lengthened tour, resort to the accompanying device. Whilst the captain is being measured by the foreman, the junior partner, behind the screen, adjusts the camera for his photograph.—*Punch.*

The Sale at M. Silvy's.—An auction sale of photographic effects is somewhat a novelty; the announcement of one did not, however, attract many known photographers, and the few we observed present seemed to have been drawn rather by the desire to see the premises of a gentleman who—notwithstanding the inquiry of the President of the Photographic Society, "Who is Silvy?"—has acquired one of the most extensive photographic connections throughout the country, and a reputation European in its extent. A royal album he showed us recently contained portraits he had taken of members of almost every royal family on the Continent. The large premises behind the house present the aspect at this moment rather of a builder's yard than anything else, in consequence of extensive alterations and increased appliances for the coming year. The day before the sale about a thousand negatives were in course of printing amidst this chaos. The effects offered for sale were chiefly the residue of apparatus, specimens, &c., which M. Silvy had received from Caldesi and Montecchi, in purchasing the business of them two or three years ago. It was somewhat amusing to hear the auctioneer, in offering the goods, commending them as of "tried quality," forgetting to add, however, and "rejected." Some of the articles sold were doubtless of good quality, and many were of that character which *will*, somehow or other, accumulate in every studio of any standing, cumbering it without adding to its efficiency. Many of the articles sold for singularly small prices, and many others for sums much higher, we apprehend, than their original cost. An 8-inch French single lens, for instance, sold for £30, a sum which struck us as excessively high for an unnamed, untried, unguaranteed lens, without even its focal length stated. Some excellently executed coloured specimens sold for much less than the value of the frames. The proceeds were, we believe, in round numbers, about £180.

Turner's "Liber Studiorum."—The *Athenæum* says:—"The series of photographs from Turner's *Liber Studiorum*, published by Messrs. Cundall and Downes, would be more valuable if extended to embrace the whole number of seventy-one drawings made by the artist towards the one hundred of his original intention. Many more of these works are, we understand, in possession of the Trustees of the National Gallery than those already reproduced from the series at South Kensington. Is there any reason why the photographed *Liber* should not be completed for the benefit of the public and artists? Renewed examination of the series has strengthened our conviction that these marvellous works should be disseminated in the widest possible range. The publishers deserve credit for what they have done towards this end; and, aided by public authority, we hope they may complete the series in question.

Photographic Exchange Club.—A correspondent says: "Regarding the "Photographic Exchange Club," I think it would be an excellent plan to write along with the other information, the kind of paper upon which the view is printed and the albumenizer of it.

The Gorilla Lecturing on Mr. Spurgeon.—The London Stereoscopic Company have just issued a clever little pictorial *jeu d' esprit* in the form of an album-photograph, representing an excited gorilla lecturing to an audience of still more excited gorillas The subject of his lecture is a dissenting preacher, who it is well-known has acquired a certain kind of celebrity by lecturing on apes and vermin. A sculptured bust of this gentlemen is placed upon the table before the oratorical gorilla who rests one hand on the head, whilst the other is extended in characteristic fashion. The date of the scene is supposed to be A.D. 5862. Behind the lecturer is "an ancient engraving: date, 1862," representing a well-known portrait of the preacher. The origin of this quizzical sketch is indicated in a quotation from the speech of Mr. Layard, in which he refers to the possibility in "after ages of having a gorilla lecturing on Mr. Spurgeon." In the attempts to produce something funny the art has often been prostituted to purposes with which, as we have before declared, we have no sympathy. We think in this case, however, there is "fair game" in the circumstances. The photographic effect, however managed, is very clever.

To Correspondents.

*** To our Readers.—The next number of the Photographic News will contain the Index to the Fifth Volume. It will consist of four extra pages, for which no additional charge will be made. Arrangements are in progress for articles on a variety of interesting subjects, which have hitherto received very little attention. Amongst others we may mention a series of articles critical, descriptive, and suggestive, on the whole of the apparatus at present used in photography, considering how far the means in existence are best adapted to the ends in view, or how they be made so.

Cass.—The mottled mealy effect of which you complain is, unfortunately, very common with some samples of albumenized paper, when the alkaline gold toning bath is used. The best remedy is slow toning. The stronger the gold toning bath and the more rapid the toning, the greater the danger of mealliness. Try the toning bath with the acetate of soda which we have given several times lately, and which is also given in the Photographic News Almanac. Many operators have, by the use of this bath, succeeded in entirely getting rid of this mottled effect.

N.—The "Sablier Compteur" arrived safe, and we are much pleased with it. Thank you for the courteous attention. We will ascertain if some manufacturer will introduce them. For general photographic purposes, perhaps it would be well to have them graduated to 60 seconds. We will introduce the matter to our readers shortly.

W. Bartholomew.—We are obliged by your communication which shall appear in our next. We will, as early as our engagements permit, try the processes. We presume the rapid plates with which you recently favoured us, were by the last described process. We hope to try them soon.

Annesley Free.—It is always desirable to remove the free nitrate of silver from the print previous to immersion in the toning bath. We give it two or three changes of water, allowing it to remain five minutes in each.

Charles West.—Three thicknesses of your yellow glass will render your dark room much too obscure for convenient working, and it is doubtful whether, in full sunlight, they will entirely resist the actinic rays. One thickness allows all the green rays to pass, and a small portion of the blue. One thickness of a suitable glass would be much more efficient than three this. We cannot give you any certain information as to where a certainly good sample can be had, for it frequently happens that a perfectly non-actinic quality is kept one day by a firm, and on the morrow, a perfectly worthless sample is supplied as the same article. All we can do is to recommend you to ask for the silver flashed glass. We are obliged by the expressions of your good opinion.

Cornish Chough.—We have, at intervals during the last few months, published a series of articles on the best condition of collodions, bath, developer, &c, for iron negatives. The Photographic News Almanac just issued, contains some carefully considered articles on the same subject. For wet collodion and iron development we prefer a bath very slightly acid with nitric acid; collodion made from pyroxyline obtained at a high temperature with weak acids; ether and alcohol in equal proportions, or an excess of the latter; iodized with a mixture of cadmium and sodium and about half-a-grain of bromide to four of iodide. For details see our Almanac.

Leicester.—At the present time, we believe, *Cartes de Visite* are the most remunerative class of portraits, produced by professional photographers. They are not the most profitable, *per se*, perhaps, as there is a good deal of printing, mounting, &c., for the money; but they are generally ordered in quantities. Moreover, if the work be well done, each one sent out is a recommendation, and almost certainly brings fresh custom. Thus, a sitter orders a dozen copies; in giving these to his friends, he places each one, to a certain extent, under the obligation of giving a portrait in return; and thus it happens that every portrait taken becomes, as it were, the nucleus of a fresh order. One whole-plate portrait at a guinea might be more profitable to the artist than a dozen cards at the same price; but for every single customer for the first style he may have a dozen customers for the last. We know many artists who are sending out from one to two thousand cards weekly. The tide may change in time; but there is no symptom of it at present.

Sigma.—In replenishing a bath, all you have to do is to add the amount of silver and water, which on examination you find are deficient. For instance, you wish to make your bath, which you state now contains 600 grs. of silver in 18 oz. of water, up to its original strength of 1200 grs. in 20 oz. of water. Simply add 2 oz. of water and 600 grs. of silver; and so on with other solutions. 2. The black powder in your negative bath is probably organic matter, which was present either in the water or silver, which has now become reduced by the action of light. It simply requires to be filtered out. 3. Almost all collodion makers issue bromo-iodized collodions. Thomas, Burfield and Rouch, Hughes, Horne & Thornthwaite, Keene, Perry, and many others. We believe Pontings's contains a bromide; but the maker gives no account of its preparation. 4. The germ may be removed from the white of an egg by lifting it away with a fork.

Ein Frager.—Photographic transparencies may be exhibited in the magic lantern just in the same way as the usual lantern slides. The transparencies are produced from a negative, either by means of super-position or camera printing. Several articles on the subject have appeared in the present volume, as the index will show. The article on Copying and Enlarging, in the Photographic News Almanac, describes the mode of proceeding in camera printing.

T. G. S.—It is probably the fault of your camera or dark slide. Focus some object carefully, and then remove the ground glass, and put the dark slide with the back open in its place, with a piece of greyed glass in the position which would be occupied by the plate. If the image be not sharp on the greyed glass, the dark slide is in fault and will require adjusting, so as to bring the plate into exactly the same plane as that occupied by the ground glass focussing screen.

X. Q.—In all our statements of formulæ where "acetic acid" without any qualifying term, is mentioned, glacial acetic acid is meant. In articles extracted from American or other journals we cannot be so certain as to what is meant; but we always receive the term as meaning glacial acid.

Amateur in Positives.—We have never used the American Niello paper, but we presume the manipulation will be the same as with mica. Of course the same chemicals as usual will be used.

T. R. H.—If you made ten grains of chloride of gold into a bath, and used the whole at once to tone your prints, you did a very unnecessary and foolish thing. One grain of gold is sufficient to tone thirty or forty album portraits, and that is quite as many as, or more than you should have in at one time. It is easy to replenish the bath with unused solution when a few dozen prints are toned, and the operation begins to be tardy. By following such a course you could never risk the waste of much toning bath at a time. A variety of causes will produce precipitation of the gold. Immersion of the prints without having removed the free nitrate of silver, or contact with fingers which have recently touched the hypo will do it, and various other causes. Do not throw the bath away, however; if it refuse to tone, precipitate any remaining gold by means of protosulphate of iron. The gold will be thrown down as a dark powder, which may, when sufficient of such residues are collected, be made into chloride of gold by solution in aqua-regia in the usual manner. 2. Glass positives are vignetted in two or three ways. The best is by placing a screen with a vandyked aperture of the desired shape, a few inches in front of the lens so as to be completely out of focus. If the figure is to graduate into a light ground, the screen must be painted a light colour: if into a dark ground, the screen must be dark. In each case the background screen should be a similar tint to the vignetting screen.

Several Correspondents in our next.

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